The Chemical Age

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Chemistry of the Future

SIR ALFRED MOND, at the Chemical Society's annual dinner last week, was not long in justifying Professor Donnan's description of him as "a man of vision and imagination." In the closing speech of the evening he drew a picture of a time when chemistry would have solved our food problems not merely by intensive fertilisation, but by advances in synthetic processes, and even made us partially independent of soils and ordinary processes of growth. Even among chemists it seemed a daring prophecy. Yet it was hardly more startling than the remarkable prophecy of the late Lord Salisbury at the Chemical Society's dinner of 1891, when he asked why this country should have to go to Chile for nitrogen instead of taking it from the inexhaustible supplies in the air. What probably sounded highly pedantic to Lord Salisbury's hearers in 1891 is to-day being done on an immense and steadily expanding scale at Billingham. Already this great triumph of British chemistry and engineering has ceased to astonish people; indeed, so much new ground has chemistry broken in the last decade or two that the limits of astonishment have already been reached. Fifty years hence Sir Alfred Mond's prediction may be accepted as an equally matter-of-fact achievement. It is the prevision of these distant and obscure possibilities that first opens the way to their realisation, and supplies research with fresh worlds to be conquered.

In the other speeches, the predominant note was the internationalism of science. No fewer than five of the speakers represented nationalities other than our own, and they all spoke in our own tongue. If there was some slight variation in accent, there was none in sentiment, and everyone must have welcomed Sir William Pope's wish that Professor Ernst Cohen would succeed in his mission to bring the chemists of all nations into a true alliance. The Chemical Society, in its quiet dignified way, is doing a good work in promoting these international relations.

Benzol Research

THE report of the Benzol Research Committee for the past year is the fifth of the series, and it carries a stage further the valuable investigations dealt with in the preceding volumes. The past year has been mainly occupied by a continued study of the formation of resins from unrefined and partially refined benzol, and the numerous questions that arise directly and indirectly out of that subject. It was already known that the process of the formation of resins was subject to the operation of many factors, and that no deductions of a kind that could be used with confidence in large scale operations could be drawn until a systematic study had been carried through in which the operation of each factor was studied both separately and in combination with others. It is satisfactory to find that a distinct advance has been made in the definite conclusion, which it is now possible to draw, that the resinification of unrefined benzols is primarily dependent on oxidation, and further results obtained are in accordance with the view that the preliminary formation of minute quantities of peroxides is the first step in the production of harmful high-boiling resinous substances.

While the ultra-violet light test is still regarded as useful in testing the liability of unrefined benzols to form resins, this test cannot be accepted as conclusive. It appears that there is a decomposing and resin-forming effect peculiar to the action of ultra-violet light which is not forthcoming under ordinary storage conditions, and ought not, therefore, to be taken into account in the process of evaluating a benzol for use as a motor spirit. What is regarded as a more promising test has been worked out, based upon the now established fact that resin formation is primarily due to oxidation. As regards the inhibiting action of certain substances, the results are now to be subjected

to large scale technical tests, and for this purpose various benzols with and without inhibitors are being placed in store for four months, after which they will be finally subjected to engine and laboratory tests. An Engine Tests Sub-Committee has been formed, so that trials of a number of benzols refined in different ways, and with or without inhibitors, can receive this ultimate trial before any decision is reached as to amending the existing specification.

Another branch of the committee's work has been on the comparative absorptive efficiencies of wash oils for benzol recovery. The report for 1928 deals exhaustively with these subjects, and the members of the committee are to be congratulated on the valuable work they are doing for the industry.

Trade Recovery and Developments

IN this issue notices are published of many British productions, mainly on the mechanical side, of great importance in chemical industry. Though not entirely comprehensive, they are representative, and they should serve to give our overseas readers some idea of the variety of plant and other products now obtainable in this country. The publicity given to British industry in recent years is clearly bearing fruit, and there are signs on every hand of decided recovery from the depression following on the coal strike and other adverse influences.

A good illustration of this recovery was provided by the speech on Tuesday of Mr. C. A. Hill, the chairman of British Drug Houses. This company, very shortly after a successful flotation, went through a period of great depression owing to labour and other troubles. The story of this year's trade is happily a very different one, demonstrating the soundness of the fine chemical industry and strengthening confidence in its future. At the annual meeting of Hadfields, Ltd., Sir Robert Hadfield told a similar story of difficulties successfully overcome and a steady restoration of prosperity. The general trend of the steel industry, Sir Robert remarked, is towards quality rather than quantity, and his testimony to the achievements of this country in the production of alloy and non-alloy types and to the developments in the motor industry supplies a convincing answer to what he describes as "the lamentations of certain Jeremiahs." This tone of confidence is an asset in itself, and it is satisfactory to find it growing.

Some Important Patents

RECENT patent literature has contained points of very exceptional interest. This week, in our list of specifications accepted, there is a patent dealing with the manufacture of ethylene glycol, in the name of the British Dyestuffs Corporation, K. H. Saunders and H. Wignall. It has, of course, been known for some time that the production of ethylene glycol in this country was under consideration; in fact, the growing use of this substance and its derivatives as solvents and for other purposes rendered its production here imperative. There can be no doubt that the large-scale manufacture of these products will have immediate and important results.

In the list of international specifications not yet accepted published in the last issue of THE CHEMICAL AGE were two from the I. G., dealing with the production of synthetic rubber. It is, of course, impossible to judge from the details given in the specifications how near the I.G. has come to the point of commercial production, which is probably a long way off, but at any rate the information to hand shows the lines of development. In the first specification (British Patent 283,840), hydrocarbons such as butadiene, isoprene, etc. are emulsified in inert aqueous liquids such as solutions of soaps, albuminous substances, sulphonated fatty acids, etc., and then polymerised in the presence of oxygen, using an accelerator such as sodium perborate. An example given deals with the polymerisation, in the presence of oxygen, of a mixture of isoprene and dimethylbutadiene emulsified with egg albumen and soap in water. In the second specification (British Patent 283,841) there is described the polymerisation of butadiene, etc. by treatment with sodium or potassium in an atmosphere of hydrogen, nitrogen, or carbon dioxide, in the presence of an inorganic hydroxy compound or ether of high molecular weight, such as starch, cellulose, a cellulose ether, or superficially oxidised rubber.

Books Received

DIRECTORY OF PAPER MAKERS, 1928. London: Marchant Singer and Co. Pp. 272. 5s. 6d.

THE STRUCTURE OF AN ORGANIC CRYSTAL. Fison Memorial Lecture, 1928. By Sir William H. Bragg. London: Longmans, Green and Co., Ltd. Pp. 32. 1s. 6d.

COLOURED THINKING AND OTHER STUDIES IN SCIENCE AND LITERATURE. By D. F. Fraser-Harris. London: George Routledge and Sons, Ltd. Pp. 269. 5s.

SCIENCE FOR YOU. By J. G. Crowther. London: George Routledge and Sons, Ltd. Pp. 241. 5s.

THE MINERAL INDUSTRY OF THE BRITISH EMPIRE AND FOREIGN COUNTRIES. BROMINE. By the Imperial Institute. London: H.M. Stationery Office. Pp. 19. 6d.

COLLOID SYMPOSIUM MONOGRAPH. Edited by Harry Boyer Weiser. New York: Chemical Catalog Co., Inc. Pp. 394. $6.50.

COHESION AND RELATED PROBLEMS. A General Discussion held by the Faraday Society, November, 1927. London: The Faraday Society. Pp. 120. 10s. 6d.

LABORATORY MANUAL OF COLLOID CHEMISTRY. By Harry N. Holmes. London: Chapman and Hall. New York: John Wiley and Sons, Inc. Pp. 228. 15s.

The Calendar

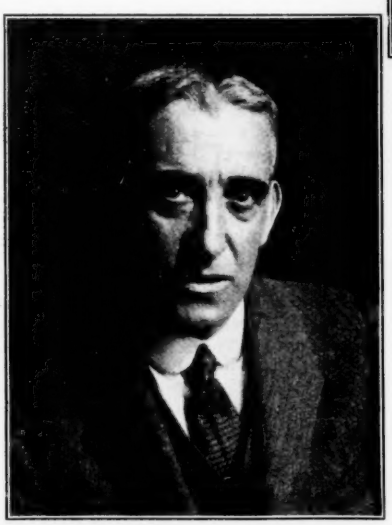
Apr.		
2	Society of Chemical Industry (London Section): Annual Meeting. "The English Beet Sugar Industry." Mr. C. D. Adams. 8 pm.	Burlington House, London.
2	Institution of the Rubber Industry.	Engineers' Club, London.
2	Society of Chemical Industry (Yorkshire Section): Annual General Meeting.	Great Northern Hotel, Leeds.
3	Institution of Petroleum Technologists: "The Oil Well and Later Developments at Hardstoft, Derbyshire." Dr. Arthur Wade. 5.30 p.m.	John Street, Adelphi, London.
4	Society of Public Analysts. 8 p.m.	Burlington House, London.
12	Oil and Colour Chemists' Association: "False Equilibria." R. P. L. Britton.	8, St. Martin's Place, London.
12	Institute of Metals (London Section): Annual General Meeting. "Alchemists in Art and Literature." R. B. Pilcher. 7.30 p.m.	83, Pall Mall, London.
13	Oil and Colour Chemists' Association (Manchester): Annual General Meeting.	Milton Hall, Deansgate, Manchester.

Recent Chemical Appointments and Elections

DR. W. E. GIBBS, RAMSAY PROFESSOR-ELECT OF CHEMICAL ENGINEERING AT UNIVERSITY COLLEGE, LONDON.

PROFESSOR E. C. WILLIAMS, WHO IS RESIGNING THE RAMSAY CHAIR OF CHEMICAL ENGINEERING TO JOIN THE RESEARCH ORGANISATION OF THE SHELL OIL GROUP.

PROFESSOR J. F. THORPE, F.R.S., THE NEW PRESIDENT OF THE CHEMICAL SOCIETY.



MR. E. HINKS, F.I.C., THE NEW PRESIDENT OF THE SOCIETY OF PUBLIC ANALYSTS.

DR. J. H. QUASTEL, FELLOW OF TRINITY COLLEGE, CAMBRIDGE, WHO HAS BEEN AWARDED THE MELDOLA MEDAL.

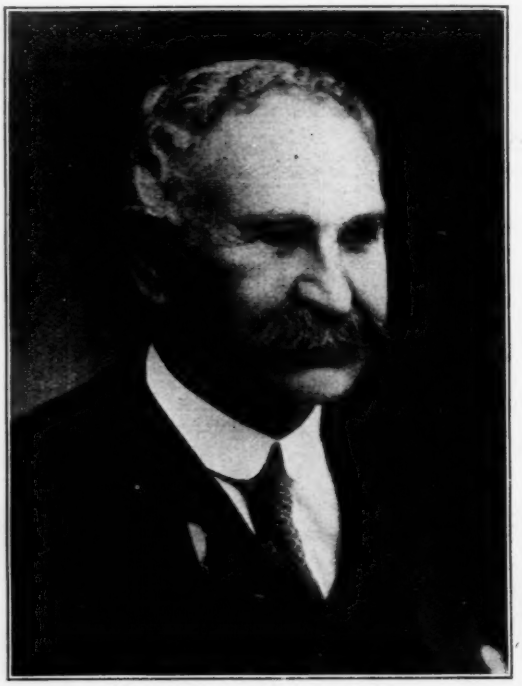
Rail Transport as Applied to the Chemical Industries

By J. H. B. Jenkins, F.I.C.

The author of this article, who occupies the responsible post of chief chemist to the London and North Eastern Railway Co., reviews the gradual development in the facilities granted by railway companies for the transport of chemical substances, and points out a number of considerations to be taken into account in the carriage of explosives, liquid chemicals, and other dangerous products requiring special handling. Sir Felix Pole, general manager of the G.W.R. (whose portrait appears on the opposite page) has taken a keen interest in the development of modern rail and road transport.

THE first of January, 1928, the "Appointed Day," was of considerable interest to all traders, for then the new classification and rating for the carriage of goods came into force. This new classification has been drawn up by the Government Rates Advisory Committee, and whilst for ordinary purposes it takes the place of the familiar "working" classification of the Railway Companies, it is more strictly the successor of the Parliamentary or Statutory Classification of 1892. The latter classification was also the result of the revision by a Government Committee of the previously existent railway classification.

Thus, we have two Government Classifications, that of 1892, and that of 1928, separated broadly by a generation, and in each the merchandise is arranged in different classes for rating purposes. In the earlier book there were eight such classes, but it was found in the later revision that this limited number of classes did not offer sufficient differentiation. Fresh classes were thus interposed so that the steps were not so steep; thus the eight classes of the earlier classification have now become twenty, but the main principles of classification remain the same, the Government Committee having decided them to be the best so far as the country's trade was concerned.



MR. J. H. B. JENKINS, F.I.C.

It is doubtful if there exists a more convenient index to the main commodities with which the commerce of the country is carried on than is to be found in the contemporary railway classification of goods. But there is an independent interest in the comparison, such as is now possible, between these two books, separated in the dates of issue by a generation. We can judge how matters have moved by noting the entries in the earlier classification which no longer appear: for example, *Velocipedes* find a place in the earlier classification—people are already disputing what velocipedes are, so completely have they passed from sight and almost from memory.

There is a very great increase in the number of the items in the new classification to correspond with the greater diversity of materials now passing, but when we compare the chemical products in the two books the increase is so astonishing as to justify the claim that we now live in a chemical age.

Better Facilities for Chemical Transport

The comparison of the two books shows clearly that the railway companies to-day are more responsive to the desires of the chemical trade for facilities for the carriage of their commodities, many of which naturally require special care and conditions for safe handling. This is shown by the expressions of view of representative chemical manufacturers about 1892. We will refer to two such criticisms of that time, each made by a highly respected chemical manufacturer, Mr. David Howard, an early President of the Society of Chemical Industry. Speaking on May 6, 1889, he said, referring to the indisposition at that time of the Railway Companies to facilitate the sending of explosives:—

"It was a common habit on the part of railway companies to practise what was, he thought, falsely alleged of those interesting birds who were said to hide their heads in the sand when danger threatened. It was no trifling matter for the public that in dealing with these dangerous bodies the action of the railway managers was practically equivalent to saying to the manufacturers, 'Do not tell us anything about it, but we will make such regulations that smuggling will be a necessity.'"

This strong criticism enables us to make a comparison. If we take successively the lists of explosives carried by the railway companies then and now, we find this. In 1891, only 23 explosives are listed as carried by the railway companies, whereas the classification which came into force this year shows that no less than 432 explosives are now carried by the companies. This, of course, is not simply a reflex of an increased disposition on the part of the railway companies to facilitate the carriage of approved explosives, but it illustrates even more strongly the increase, during the period under review, of the resources of chemistry as applied to every art, evidencing again that we live in a chemical age.

The second comment by Mr. Howard we have in mind was made about the same time in the course of a discussion on an unusual explosion of a package in the railway companies' keeping. The Home Office Explosives Department experts had investigated it and given the opinion that the package, only declared as containing sodium dioxide, had also contained some sulphur compound, perhaps in the form of a strong solution, and it was the interaction of these by leakage which had caused the explosion.

Mr. Howard, after calling attention to the constituents of gunpowder which are relatively harmless individually and apart, yet when intermixed form such a dangerous commodity, laid stress upon the obligation on carriers to exercise great discretion in loading one type of traffic with another, and drew on his memory as follows:—

"In his boyhood there was a very ugly fire at one of the docks, said to have arisen from the impression that jute, cubic nitre, and sulphur were dangerous things and therefore should be stored in the same warehouse. The story went that the jute and sulphur were on the lower floor and the nitre on the top, and the heat causing the nitre to melt they could imagine what happened."

The Carriage of Dangerous Goods

This comment illustrates a very real difficulty on the part of the railway companies as carriers. Very broadly, dangerous goods are those which, in case of leakage or accident, are likely to entail, not simply the loss of the goods originally concerned, but also other goods, property or lives; and there are, besides, substances which themselves are relatively harmless, but may yet develop very serious dangers if brought into juxtaposition with certain other materials. Sometimes the firms who send out the individual products do not fully sympathise with the steps which the railway companies have

to take to prevent such dangerous proximity with certain products from other sources.

The need for exceptional care in the case of the carriage of explosives is so evident as to need no enforcement; further, a moment's consideration will serve for us to realise the serious effects, if not to other goods, yet to the railway companies' own wagon stock, if, say, a carboy of strong mineral acid breaks and bathes the wagon and its undergear with the corroding liquid. But possibly not so often remembered is the fact that a small quantity of such a liquid as aniline oil may, unless it is segregated from other goods, lead to very extensive claims for staining-damage to stationery, foodstuffs, etc. —the slightest vapour of the aniline and kindred substances being sufficient to provide such damage.

The need for such segregation is also evident in connection with the carriage of poisonous substances. For example, the conditions inside a factory, where hundreds or thousands of cans of arsenical weed killers are turned out and where nothing is near which can be damaged by contact, are very different from those which come in when the packages leave the factory, and special regulations are necessary for safety when such substances pass into the care of carriers whose duty it is to deal at the same time with every variety of foodstuff and merchandise.

The Position in 1892 and 1928

In connection with the acceptance and regulation of dangerous traffic by train, an interesting comparison can be made between the position in 1892 and 1928.

The interval has been marked by a growing tendency on the part of traders and railway companies to discuss together the difficulties on either side, and the present regulations for the safe carriage of chemicals, where such require special care, have been largely the outcome of such conferences.

In connection with poisonous materials, etc., there has been introduced a uniform series of labels, illustrated on page 98 of the "Dangerous Classification," to be attached to the packages, the labels varying according to the nature of the contents, and thus the railway companies' staffs are given the means of judging immediately the type of sequestration from other goods which should be observed.

SIR FELIX J. C. POLE
(General Manager G.W.R.)

Carriage of Liquid Chemicals

In the means of carriage of liquid chemicals, such as mineral acids, considerable advance has been made recently, and is still being made. The carboy, so largely used in the past as a container, is by general consent very unsatisfactory, owing to its fragility. The consequential damage in transit, in case of breakage, is likely to be far greater than the acid lost. But the convenience of the carboy tells in its favour, besides the difficulty in finding satisfactory substitutes. In recent years this difficulty is being overcome. So far as sulphuric acid is concerned, provided that the strength is sufficiently great, it is conveniently carried in iron rail tank wagons, or smaller quantities are carried in iron drums. For hydrochloric acid it is more difficult to find alternatives to the carboy. When large quantities have to pass, the railway companies have approved the use of certain tank wagons made of wood whose inner surfaces are faced with layers of pitch and paraffin wax. Wagons are also accepted which contain large permanently fixed earthenware jars which hold an aggregate of several tons of acid. More recently, iron tank wagons are being introduced whose inside surfaces are completely protected by a facing of ebonite. This is perhaps the most useful and reliable container at present, though some brittleness is evident in the lining, and this leads to minor troubles. Perhaps some advantage would attend the efforts to stop the vulcanisation before it reaches the ebonite stage—to produce, whether for tank wagons or iron drums, a consistent coating of india-rubber. It will, however, be evident that if a crack or flaw develops in the lining so as to let the hydrochloric acid get into contact with the iron, the consequent development of hydrogen gas may constitute a very serious danger of explosion.

For the carriage of acetic acid and acetic anhydride, aluminium drums and tank wagons are being considered. For nitric acid, too, aluminium containers are useful. But special interest attaches to the rail tank wagons now authorised for the carriage of strong nitric acid; these are made of a special variety of stainless steel known as Staybrite steel, and it is likely that in the future, tank wagons and drums made of this alloy will solve the difficulty of getting a non-fragile container for nitric acid when going in large consignments. The possibility of the use of this or similar alloy metals, not only for nitric acid, but also for other acids, should not be lost sight of.

Motor Spirit

To turn to another chemical now of the greatest importance it may be pointed out that motor-spirit scarcely existed in 1892. It was at the commencement of the present century that the rapid extension of the use and supply of this body called for special rail facilities. The now universally known two-gallon petrol can was designed for rail traffic, and the well-known special rail tank wagon was designed about the same time. It is interesting to note that the development of the motor car industry has had a significant secondary effect on what was a burning, almost an exploding, question a generation ago. The older of us can remember the vigorous campaigns which were being carried out then in the Press in favour of requiring by law a safer petroleum or paraffin oil to be used in table lamps—that such oil should have a minimum flash point of 100° F., whereas the legal requirement was only 73° F., and many accidents and explosions were reported in support of the claim for an improvement in the flash point. But at that time it was difficult for the oil companies to dispose of the more volatile fractions of petroleum distillate, so that as much as possible was left in the ordinary lamp oil, and the flash point lay at the very minimum permitted by law. But the need for any further disputations was obviated by the development of the motor car industry; the lighter and more volatile fractions, previously a drug on the market to be left as far as possible in the oil, are now carefully removed to contribute to the ever-increasing need for motor spirit, so that now, whilst the legal limit is still 73° F., the actual flash point of lamp petroleum is very rarely, if ever, below 100° F.

Compressed Gases

To turn to another class of chemicals, there has been an astonishing development of traffic in compressed gases. These are scarcely seen in any form in the 1892 Classification, and —to take one of them, chlorine—the Home Office Committee reporting in 1896, found no sufficient evidence of traffic to justify any provision for it in their recommendations; yet now it passes in cylinders ranging from those of a few inches in diameter up to specially designed rail tank wagons carrying each about fourteen tons of chlorine, the gas in these containers existing, of course, in a liquid condition owing to the pressure.

Broadly, the policy of the railway companies, in connection with the conveyance of all such dangerous goods as have been

mentioned, is to consider jointly with the traders any such proposals, and if such consideration is favourable, to provide facilities, or, where more experience is necessary, to permit the use of new types of containers for an experimental period before any final decision is arrived at, and there is an increasing tendency on both sides to discuss in conference the difficulties on either side, with the hope of finding a mutually satisfactory solution.

It is difficult to generalise when so many different types of substance are involved as in the chemical industry; but it is perhaps safe to say that developments in economic transport are dependent on the growth of larger consignments. The dangers attending the possible intermixture of different chemicals are removed when wagon load quantities pass at a time, and the economics of tank conveyance are naturally inapplicable to smaller lots. The chemical industry illustrates, therefore, in a marked degree, the advantages of large scale distribution, advantages which are not by any means confined to that industry—unless it is itself defined to embrace all created things.

The Chemical Society's Dinner: A Brilliant Gathering

The Internationalism of Science

A feature of the annual dinner of the Chemical Society, held in London last week, was the large number of distinguished foreign representatives, and the emphasis laid by so many speakers on the internationalism of chemistry and, indeed, of science generally. The gathering was also notable for Sir Alfred Mond's prophecy as to the production of synthetic foodstuffs.

THE annual dinner of the Chemical Society, held on Thursday, March 22, in the Edward VII Rooms at the Hotel Victoria, was a brilliant function, and at the same time one of the most homely and sociable character. There was an unusually large assembly of distinguished British and foreign guests, wearing decorations indicative of achievements in many fields, and one saw on every side men of science whose names are known the world over for their work in extending the boundaries of human knowledge. Yet there was nothing forbidding about their greatness; they seemed to represent, not the knowledge that is proud that it has learned so much, but the wisdom that is humble that it knows no more. They were in a very human and club-like mood; they joked and laughed like any body of undergraduates; and when Sir Frank Dicksee announced his discovery that the English chemist is just an English gentleman, one felt that no further word was needed.

A Distinguished Company

Professor J. F. Thorpe, newly installed in the presidential chair, presided, and the large company included Lord Chelmsford, Sir Alfred Mond, Professor H. B. Baker (the immediate past president), Sir Ernest Rutherford, Mr. F. H. Carr (President of the Society of Chemical Industry), Mr. R. Fitzmaurice (Vice-President of the Chemical Warfare Committee), Mr. C. M. Forbes (Director of Naval Ordnance), Sir Alexander Gibb (President of the Institution of Chemical Engineers), General Sir W. Gillman (Master-General of Ordnance), Sir Richard Gregory, Professor Ernst Cohen (President of the International Union of Pure and Applied Chemistry), Dr. Desch (President of the Faraday Society), Sir Frank Dicksee (President of the Royal Academy), Mr. C. A. Hill (Chairman of the Association of British Chemical Manufacturers), Mr. E. Hinks (President of the Society of Public Analysts), Sir Thomas Holland (Rector of the Imperial College of Science), Professor Holmberg (President of the Kemistsamfundet, Stockholm), Sir William Lawrence, Sir William Pope, Mr. Saastamoinen (Minister for Finland), Mr. Herbert Skinner (President of the Pharmaceutical Society), Mr. R. E. Palmer (President of the Institution of Mining and Metallurgy); Mr. C. R. Paravicini (Minister for Switzerland), Professor W. H. Perkin, Mr. T. F. Purves (Vice-President of the Institution of Electrical Engineers), Sir Robert Robertson, Sir Richard Threlfall, Mr. H. T. Tizard (Secretary of the Department of Scientific and Industrial Research), Mr. W. D. Treadwell (President of the Société Suisse de Chimie), Mr. E. F. C. Trench (President of the Institution of Civil Engineers), Sir Edward Troup (Chairman of the Safety in Mines Research Board), Dr. W. Wahl (Vice-President of the Finska Kemistsamfundet, Helsingfors), Professor Bedson, Mr. E. R. Bolton, Mr. F. A. Freeth, Professor Donnan, Professor Hinchley, Mr. Victor Lefebure, Dr. R. Lessing, Professor T. M. Lowry, Mr. G. S. W. Marlow, Mr. Emile Mond, Mr. Robert Mond, Professor G. T. Morgan, Mr. F. M. Rowe (Dyers and Colourists), Mr. R. N. Garrod Thomas, Professor A. G. Perkin, Professor J. C. Philip, Colonel G. P. Pollitt, Dr. T. Slater Price, Dr. E. K. Rideal, Professor W. P. Wynne, Mr. S. E. Carr (Assistant Secretary), etc. The presence of many ladies added colour to the scene.

Internationalism in Chemistry

It was Professor Thorpe who started the jovial note that characterised the gathering, in responding to the toast of "The Chemical Society," proposed by Lord Chelmsford. For the greater part of the time, he entertained us with bland good humour, gently tilting at the modern systems of chemical notation and nomenclature, and concluding with an orthodox plea that the funds should be kept on sound lines, and that everything should be done to help and nothing to hinder the influx of new blood, without which any society must die of old age.

Sir William Pope, in proposing "International Chemistry," reminded us that this was the first occasion on which such a toast had been proposed, and emphasised the international aspect of all scientific work. It was appropriate, he said, that the English Chemical Society should be the first to introduce the toast, for it was the oldest chemical society in the world. During the 87 years of its existence, it had seen grow up many chemical societies all over the world and the international union brought them into one great brotherhood for the development of chemical science.

The speeches by the four foreign representatives associated with the toast, representing Holland, Sweden, Switzerland, and Finland, were among the most interesting of the evening and were all delivered in English. Professor Cohen, who has long since ceased to be a "foreign" guest, so familiar and welcome has he become at these gatherings, succeeded in speaking without mentioning his beloved Shakespeare more than once. He pleaded with all to make the international union of chemistry a real force in bringing the chemists of all nations together. Professor Holmberg remarked that while chemistry was international, every country had also a chemistry with certain national characteristics. Between Sweden and England there was one point of resemblance in their love of freedom and the independent thinking which resulted from freedom, and which in this country had resulted in epoch-making revolutionary theories and discoveries. Professor Treadwell, speaking for Swiss chemists, said that international intercourse between chemists had become a necessity, and the exchange of the students of the various countries was of the utmost importance. Professor Wahl (Finland) acknowledged the world's debt to great English chemists, both past and present, the high level of chemical experimentation attained in this country, and the brilliant advances made in the synthetic field. Referring to the important cellulose industries of his own country, he mentioned that they imported from this country large quantities of English china clay. Very drily, he remarked that they just wrapped it in paper and returned it.

A New Definition of Chemists

Professor Donnan, in proposing "The Guests," entertained us, not so much with an ordered speech, as with a succession of short explosive epigrams, jokes, and *obiter dicta*, which ranged over so wide a field that they touched banana growing on the sea of Galilee on one side and the quality of Swiss cheeses on the other. Beginning with an almost irreverent

definition of chemists as " honest brokers between the Almighty and His molecules," he turned to Sir Alfred Mond as a man of rare vision and imagination, who was the best friend of chemists in this country, because the teachers could not turn them out fast enough for him. When the schools offered him ten he wanted 100 ; when they produced 100 he wanted 1,000. When Professor Donnan turned to his near neighbour, Colonel Pollitt, and introduced him as " the creator of Billingham," the company instantly showed their appreciation of this great enterprise, and Colonel Pollett made an earnest but ineffectual effort to blush. So Professor Donnan went on, with his dry crisp humour, until there was nothing more to give away about the guests whose health, he assured us, he was proposing.

Sir Frank Dicksee and the Swiss Minister briefly responded as visitors, and then came what proved to be the most important speech of the evening from Sir Alfred Mond, who began by confiding to Professor Donnan the reason he preferred to grow bananas rather than oranges on the Sea of Galilee. " The reason," he remarked with a smile, " is that it pays better."

A Remarkable Prophecy Fulfilled

As a " guest," Sir Alfred went on, he almost felt as if he were speaking under false pretences, for he was a Fellow of the Chemical Society, as his father was before him, and he was extremely proud of it. He was proud of his father's close and intimate connection with the Society ; he served on the council and was one of their vice-presidents. The Chemical Society, being the oldest one in the world of its kind, had naturally numbered among its fellows all the most distinguished names in chemistry during the last eighty-seven years, and it was of the greatest interest to one who, like himself, was an industrialist, and also who was alleged to be to a certain extent a politician, to see the way in which the science of chemistry had responded to the growing needs of civilisation.

In this connection he could not refrain from quoting a remark of the late Marquis of Salisbury, made at the jubilee anniversary dinner of the Society in 1891. He said : " I am an agriculturist and a disciple of Dr. Gilbert and others. We compass sea and land in order to get manure to make our products grow ; and what is manure ? It is an impure form of the carbon and nitrogen in which those products are bathed in the circumambient air every day of their lives. I trust that the chemistry of the future may tell us why we have to go to Chile, and why we cannot take them from the air around us."

" Gentlemen," Sir Alfred said, " the science which you represent has solved that problem, and solved it brilliantly. There is no need to go to Chile for nitrogen ; we shall soon be able to supply all that is needed. It is true that if I were addressing a society of engineers I should be compelled to pay a wholehearted tribute to the co-operation of that great and characteristically British industry, without which manufacturing progress would be impossible ; but we must not forget that it is to the chemist in the first place that we owe the solution of the problem."

Synthetic Triumphs of the Future

The problem of the feeding of future generations which occupied and alarmed thoughtful minds at the close of the last century had, thanks to their efforts, become merely a matter of development along known lines. In the last few months, in the company of authorities like Sir Frederic Keeble, he had been away in the Near East, and a careful analysis of the soil conditions of three or four countries had shown that the need for nitrogen was obvious and even clamant, and by the co-operation of the chemist and the engineer at Billingham those needs could be supplied at home. The problem of the growth of population and the food supply of the world could be solved by the artificial production of fertilisers. More than that, in another fifty years, or even sooner, synthetic food products might be produced and the complicated action of soil bacteria in producing crops would be superseded. He has already seen vitamin D synthesised in the laboratory, and if they could synthesise vitamins they might be able to synthesise all the foodstuffs they wanted, and in the case of over-population or of war there would be no necessity to starve, but they would only need to put up a few more factories to feed the people.

" You by your discoveries," Sir Alfred continued, " have literally changed the face of society in the last twenty years. The ladies, thanks to your efforts, now are more alluring than ever, and vie with the lilies of the field or the birds of the air. I understand that the new spring colour is Mavis Blue, the product of chemistry and the perfection of beauty. And how has this great change, which is still in its early stages, been wrought ? It has been brought about by the patient, steady, life-long efforts of many of the people I see around me. It is not easy for the layman to appreciate the amount of effort which is necessary to enable discoveries to be made in the first case, and I have in my youth had the advantage of seeing more than one great process in its early stages. I am sure you will agree with me that society in general has not realised the full extent of the debt which it owes to the science of chemistry.

" As regards the future, I do not think Lord Salisbury's comment on that can be bettered. He said, 'I believe that in the future, some fifty years hence it may be, in this or some other room, the President of the Chemical Society of that day will congratulate the associates of that Society on victories and on achievements of which we cannot now dream the nature. And I am quite sure that when he does so he will attribute no small share of that progress to the existence and labours of the Chemical Society.' To respond to our modern industrial needs science has made great progress. It has left the odours of the laboratory and the dinginess of the library for the high road of industrial and commercial development. Its greater and more rapid application to industry may form one of the most decisive factors in the achievement of their complete industrial co-operation to which we all so sincerely aspire."

It was on this confident note respecting the future of chemistry that this interesting gathering ended, with nothing but agreeable feelings and memories on every side. The arrangements went through with the smooth efficiency one is accustomed to expect.

The Retiring President's Address

The annual general meeting of the Chemical Society was held at Burlington House on Thursday afternoon, March 22, Professor H. B. Baker, F.R.S., the retiring president, occupying the chair.

At the conclusion of the business part of the meeting, Professor Baker delivered his presidential address, entitled " Constitution of Liquids : Some New Experiments." By means of a modification of Victor Meyer's method, the vapour density of liquids dried with phosphorus pentoxide for periods of two to ten years was determined ; in each case the molecular weight so obtained was considerably greater than the normal value ; thus the value for bromine was 242·4 instead of 160, for carbon disulphide 137·4 instead of 76, for carbon tetrachloride 201 instead of 154, for ether 173·1 instead of 74, for benzene 125·9 instead of 78, etc. The same kind of result for benzene was obtained when, by a modification of Berthelot's method, the latent heat of evaporation of the dry liquid was measured. The latent heat per gram was 58 instead of 83, and the boiling point was 94°C., so that according to Trouton's rule the molecular weight was 136 instead of 78. Thus, there are now four separate classes of experimental data in support of the view that the removal of water from liquids leads to increased molecular complexity, rise of boiling point, change of surface tension, increase of vapour density, and decrease of latent heat of evaporation.

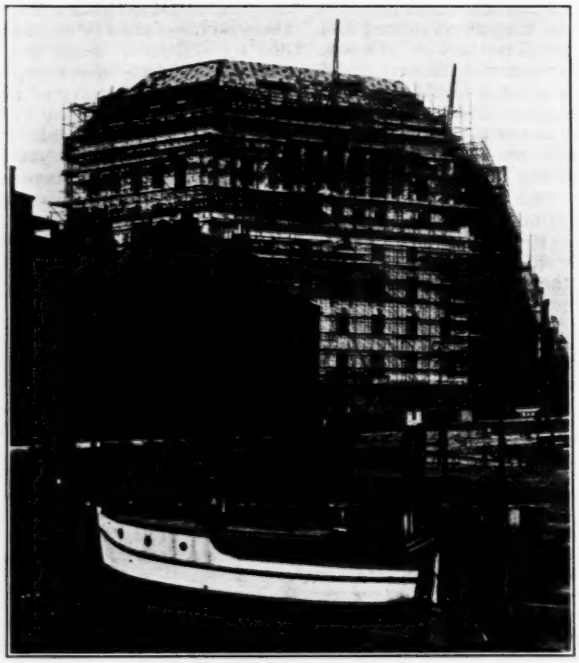
Professor Baker also showed that it is possible, even in the presence of water but in absence of facilities for its condensation into drops, to stabilise the large molecules and increase their number above that normally corresponding with a given temperature. When a potential indifference of 400 volts is maintained between platinum plates immersed in benzene (dried only with sulphuric acid), the boiling point rises from 79·6° to 92° and the molecular weight becomes two or three times as great as normally ; hexane and carbon disulphide behave similarly.

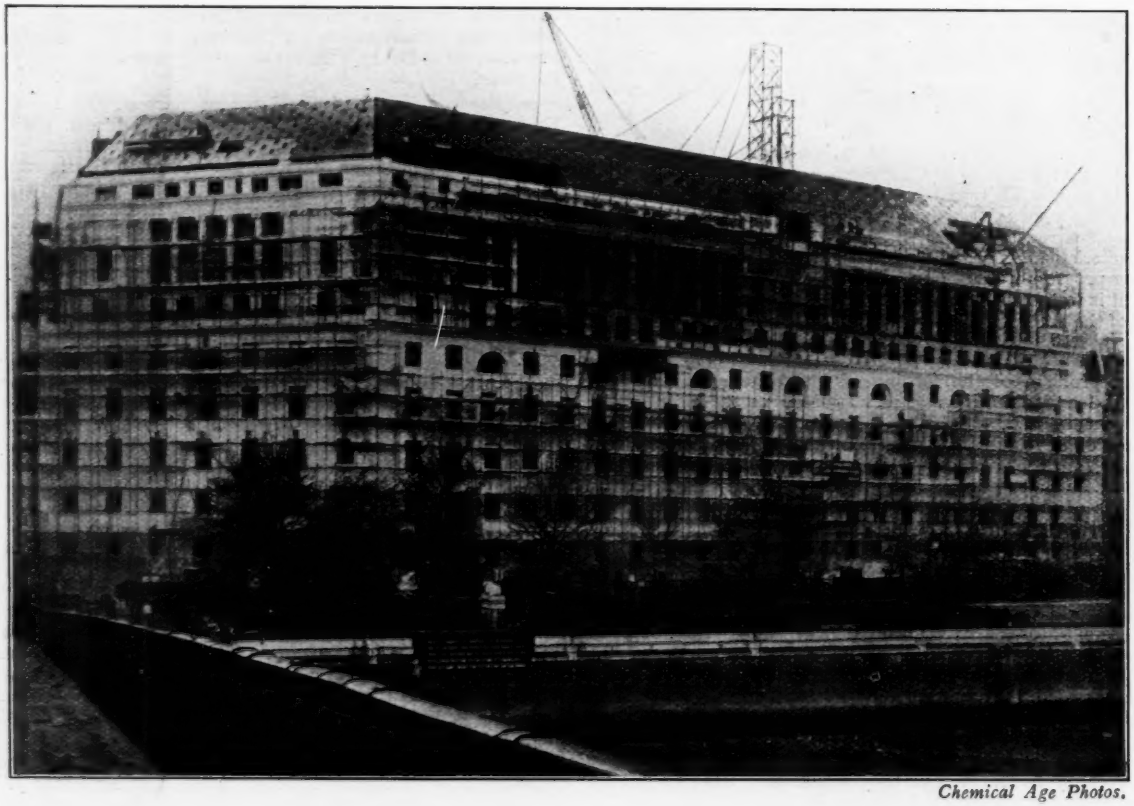
The report on the election to vacancies on the council, 1928–29, was then read, it being stated that Professor J. F. Thorpe had been elected president, Dr. T. Slater Price treasurer, and Professor T. S. Moore secretary.

THE ILLUSTRATIONS ON THIS PAGE GIVE TWO VIEWS OF THE IMPRESSIVE BUILDING AT MILLBANK, WESTMINSTER, WHICH IS BEING ERECTED FOR IMPERIAL CHEMICAL INDUSTRIES, LTD., AS THE HEADQUARTERS OF THE COMPANY. THE WORK WAS BEGUN LAST SUMMER AND THE INTERIOR STRUCTURE OF THE BUILDING IS ALREADY NEARLY COMPLETE.

THE ARCHITECT IS SIR FRANK BAINES, FORMERLY OF H.M. OFFICE OF WORKS AND NOW ARCHITECTURAL CONSULTANT TO IMPERIAL CHEMICAL INDUSTRIES, LTD. THE CONTRACTORS ARE JOHN MOWLEM AND CO., LTD., AND THE STEELWORK IS BY DORMAN, LONG AND CO., LTD.

IT IS INTERESTING TO COMPARE THESE PICTURES WITH THOSE WHICH WERE PUBLISHED IN *The Chemical Age* ON SEPTEMBER 17, 1927, AND TO NOTE THE GREAT PROGRESS THAT HAS BEEN MADE IN THE CONSTRUCTION.





Chemical Age Photos.

Notes on Plant, Apparatus, and Chemicals

An Account of Some British Products

New plant and products of various kinds appear on the market at such frequent intervals that it is very difficult to keep track of them. On this account we have from time to time published notes on products of interest. A further group of these appear below.

Prevention of Scale and Corrosion in Boilers, etc.

As a non-chemical remedy for scale and corrosion in boilers, economisers, condensers, and water-circulating systems generally, the Filtrator has been put forward. The Filtrator is an apparatus, made both for air and water cooling, which consists of an outer cast iron cylinder with an inner perforated cylinder containing ordinary commercial linseed. Live steam from any main or auxiliary steam line is introduced into the Filtrator, and the wet steam extracts the starchy or mucilaginous matters from the seed. The resultant product is a colloidal solution, and behaves as such even when mixed or diluted with either hot or cold water, as when introduced into the feed tank of a boiler installation. The whole principle of the Filtrator is such that no crushing effect whatever is exerted on the linseed, so that no oil, but only the matter soluble in water, is extracted. The oil content is left entirely intact in the husk of the seed, and there is no risk of oil being introduced into the boiler by the Filtrator process.

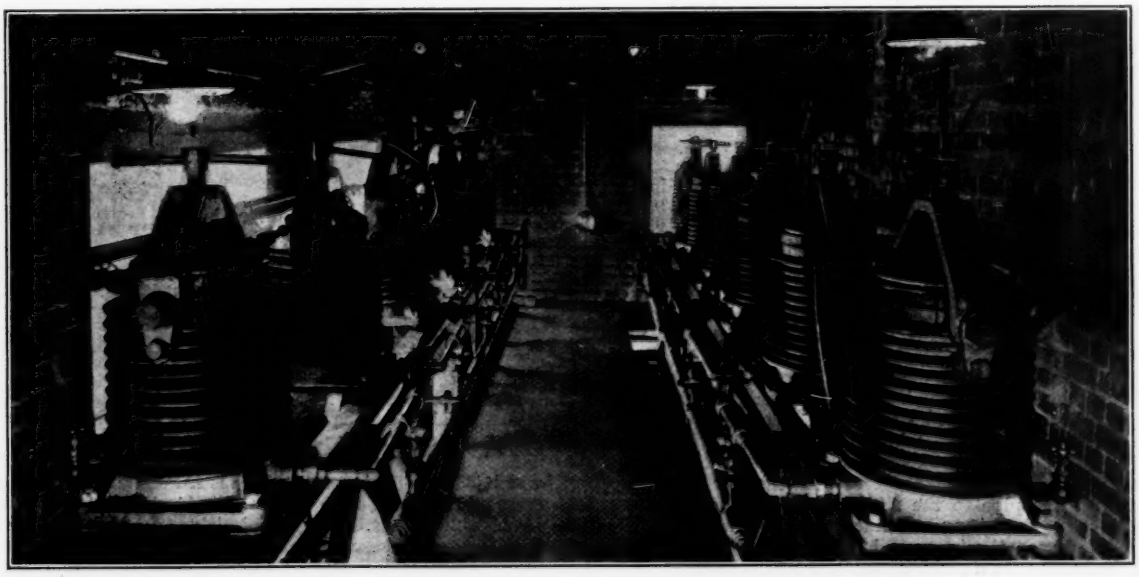
The condensation in the Filtrator being continuous, a constant supply of the linseed extract or emulsion is introduced, either into the feed tank, or the hot well, and it is this emulsion which coats over all the scale-forming particles, thereby effectively preventing crystalline growth. This film action is a mechanical process and will operate irrespective of the chemical composition of the scale-forming solids, and must, therefore, be effective not only for boilers, but wherever solids are deposited, as in economisers, evaporators, condensers and water circulating systems generally.

The Filtrator is made by Filtrators, Ltd., of Astor House, Aldwych, London, who guarantee that when the apparatus is used, the scale thickness in boilers of the Lancashire type will never exceed $\frac{1}{32}$ in., while in water tubular boilers the scale thickness will never exceed $\frac{1}{64}$ in. With the Filtrator process, the emulsion penetrates the cracks in old scale and blisters this off, so that scale in even the most inaccessible parts of the boiler will be removed. The emulsion, being chemically inert, is absolutely harmless to the metal of the boiler and its fittings, and no chemical action is in any way involved. Corrosion, due to chemical or galvanic action, is arrested. The Filtrator system is equally effective in marine practice, and for fresh or salt feed gives the same results.

It is claimed that the Filtrator prevents and removes scale; prevents corrosion and pitting; is equally effective in dealing with boilers, economisers, condensers, evaporators, and cooling systems for internal combustion engines; will last as long as a boiler; is a non-chemical system, and therefore does not set up corrosion; and is automatic and continuous as long as the boilers are under steam, so that, once it is fitted, boiler scaling is dispensed with. Filtrator apparatus has been supplied to chemical works, gas companies, oil companies, railway companies, paper mills, textile manufacturers, food product manufacturers, Government departments, etc. The accompanying illustration shows the Filtrator installation at the National Oil Refineries, Ltd., at Llandarcy.

Nordac Chemical Rubber Plant

A NEW company called Nordac, Ltd., has just been formed to develop the manufacture of chemical rubber plant on entirely novel lines. The methods are the outcome of much research work in connection with plant for the treatment of complex sulphide ores for a large chemical group in London. A means has been developed of lining existing plant *in situ* with rubber which can be cured and rendered impervious to the action of most corrosives at a price which was originally considered impossible. The work the company intend to do may be considered as rubber engineering, for they undertake not only to supply tanks, pipes and fittings, but to fit up the plant and work it exactly as is done, for example, in gasworks with ordinary iron plant. Nordac, Ltd., intend to give serious attention to the design of special plant for various chemical operations. A further feature of the Nordac methods is the use of a special adhesive cement which enables uncured rubber sheet to be applied to any surface. The address of the company is Reno Works, Wealdstone, Harrow.

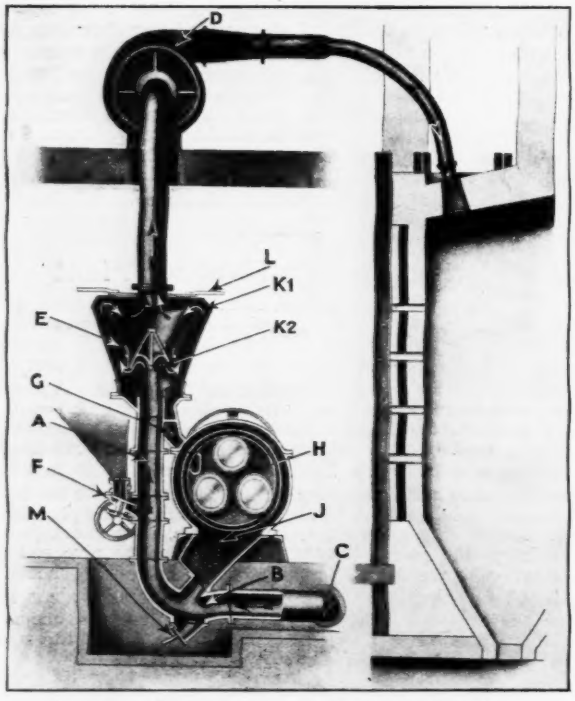


A FILTRATOR INSTALLATION AT THE NATIONAL OIL REFINERIES, LLANDARCY.

A Grinding and Separating Plant

Details of the "Rema" System.

DETAILS of operation of the "Rema" ring mill and vacuum system are contained in a catalogue received from the British Rema Manufacturing Co., Ltd., of Halifax. The mill consists of a free running grinding ring made of special steel giving long life, inside which three specially hard crushers revolve, the top crusher being mounted on the driving shaft and forming the driver. The vacuum system comprises a high efficiency fan and air sifter. The fan provides the air circulation necessary for lifting the raw material from the feeding device into the mill, for lifting the ground material from the mill outlet into the air sifter, and for conveying the fine ground material from the air sifter to whatever collecting



INTERNAL DETAILS OF THE "REMA" RING MILL.

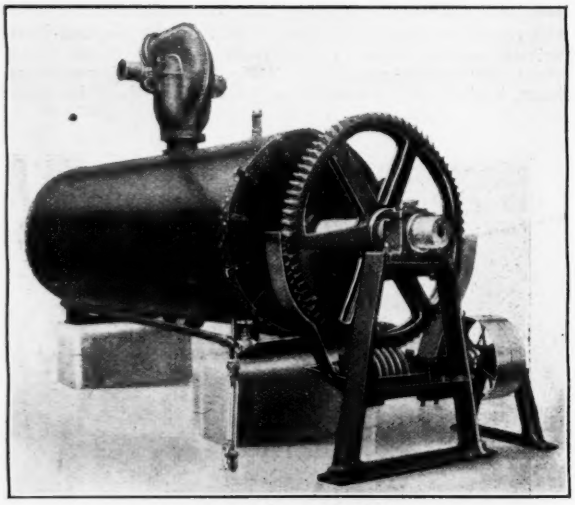
device is used. The air sifter is located between the mill and the fan, and is so designed as to separate the ground material carried up by the air circulation, automatically returning the coarser particles to the mill for further grinding and allowing only powder to pass out.

Operation of the Mill

The feeding of the raw material is through feeding device "F." The raw material is fed into the inlet pipe "A," and is caught up by the air current and lifted up pipe "A." At the entrance to the lower part of the sifter the deflecting cone "K2" tends to deliver the material into the chutes "G," and since the velocity of the air current is reduced, due to the increased area in the sifter, only fine particles of material are carried through to the inner cone. The larger pieces fall down the chutes "G" and are fed in at each side of the mill "H," thereby ensuring even distribution across the inner face of the grinding ring which results in maximum output being obtained with minimum wear on the ring. The rollers pulverise the material, which passes out of the mill outlet "J" into pipe "A" where it is entrained in the air current and again carried along together with the raw material being fed into this pipe to the sifter, where the larger pieces are delivered to the mill and the finer particles carried up the space "E" between the inner and outer cones. At the entrance to the inner cone a series of adjustable vanes are fitted to the openings "K1," which impart a centrifugal action to the dust particles entrained in the air current and the final separation is completed in the inner cone, only the very fine dust being carried out of the system by fan "D." The coarser particles fall down inside the inner cone partly by centrifugal action and partly due to gravity, to be automatically returned to the chutes "G" *via* discharging flaps for re-grinding in the mill. The "Rema" mill and vacuum system is constructed in ten sizes, the smallest having an output of 1·5 cwt. per hour and the largest will deal with from twenty to forty-five tons per hour. The British Rema Manufacturing Co., Ltd. manufacture, besides the grinding and separating system described above, a range of fans, ring mills, and crushing machines, and the firm make pulverisers which can be used with almost any substance such as phosphate rocks, bauxite, barytes, graphite and many similar substances.

Farrar Boilers and Chemical Plant

SOME useful information is given in the catalogue of the Farrar Boiler Works, Ltd., a copy of which has just been received. During recent years the range of products made by the firm has been considerably widened, and while still specialising in the manufacture of their vertical cross tube boilers they also make air receivers, tanks for the transport of liquids, and chemical and gasworks plant. All their boilers, air receivers, and tanks are constructed of steel plates made by the Siemens-Martin process. In the case of boilers the shell plates have a tensile strength of from 28 to 32 tons per square inch, and flanging plates have a tensile strength of from 26 to 30 tons per square inch, and an elongation of 23 per cent. on a length of 8 inches. Shell and circular flanged plates are carefully planed and turned on the edges and caulked both inside and out by pneumatic tools. The flanging of crowns is done in one operation and riveting where possible by hydraulic power. Horizontal air receivers are made in sizes suitable for 100 lbs. working pressure, and in the larger sizes the longitudinal seams are double riveted. Vertical receivers are also made, including a special type for high pressures. Transport tank wagons are made in capacities up to 30 tons and are specially suitable for the transport in bulk of chemicals or oils. A special tar wagon is also made and tar tanks can be supplied with steam coils to keep the tar liquid.



FISH MEAL CONCENTRATOR.

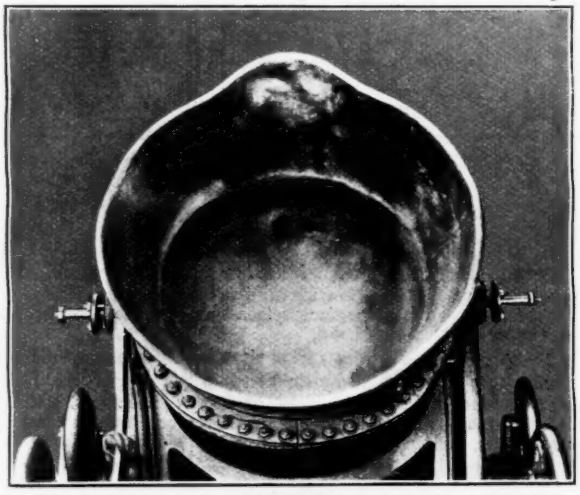
A speciality of the firm is a fish meal concentrator and guano manufacturing plant. This special plant consists of a welded steel cylinder, which is steam jacketed, at one end of which is a mouthpiece into which is fed the fish offal. A shaft drives through the centre of the cylinder, to which are attached blades and beaters. This shaft is driven through worm gearing by a fast and loose pulley on countershaft. The concentrators may be arranged in pairs and connected by an exhaust pipe at the top, and on this exhaust pipe a centrifugal fan or blower is placed for sucking away the moisture. A damper is placed

between the fan and the cylinder, by means of which the draught can be regulated. On the materials handling side a machine is made for elevating, disintegrating, and bagging such materials as superphosphate. Further plant includes steam jacketed pans in various sizes and mixing vessels. At the end of the catalogue is a compilation of useful fuel, heating, and boiler power data.

Protection and Repair of Metals

An Electro-Deposition Process

THE electro-chemical deposition of metals, when first introduced, opened up a wide field of application in the levelling-up of worn metal parts, but the chief objection to early processes was the difficulty of obtaining a perfectly cohesive and adhesive deposit of metal, in thicknesses exceeding a few thousandths of an inch. The essential for successful commercial application is an unstrippable cohesive adhesive deposit, which forms an integral part of the base metal. Further, it is desirable to apply the deposit cold, in order to obviate any distortion that may arise from heat. Details of the attainment of these ends are described in "Electro-Chemical Deposition of Metals" published by Fescol, Ltd., 101, Grosvenor Road, London, who employ the "Fescol" process of electro-deposition of metals. By this process



A COPPER PAN FOR THE CHEMICAL AND DRUG INDUSTRIES.

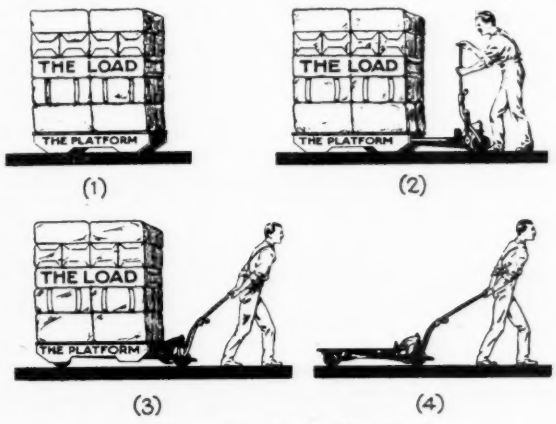
nickel, copper, chromium, cadmium, iron, cobalt, lead and zinc can be deposited, the first being most in general use, as it may be deposited on ferrous metals and their alloys to almost any desired thickness. The deposit can be preservative only, or may be used to rebuild worn parts. The process is particularly suitable in the chemical industry for coating vessels as a protection against corrosion. A deposit of pure chromium possesses many advantages, among these being extreme hardness, resistance to certain forms of chemical corrosion and atmospheric tarnish. It is impervious to the attacks of most acids (with the exception of hydrochloric and sulphuric), brine, ammonia, ammonium sulphide, or to sulphur compounds generally, and to fruit and vegetable acids. Apart from its use in applying preservative coatings, the "Fescol" process may be used in many different ways, from building up worn shafts on fan motors to the repair of armature shafts of two tons total weight.

Heat Resisting Cement for Furnace Work

J. H. SANKEY AND SON, LTD., fire brick and fire cement manufacturers, London, have forwarded details of their "Pyruma" plastic fire cement, for bonding firebricks in furnaces. Fireclay, as a setting for firebrick work, has the disadvantage that a considerable shrinkage takes place both in drying and under heat, thus exposing vital parts of the bricks to the heat of the furnace. Among its many advantages "Pyruma" is claimed to set as hard as Portland cement and to be free from cracking or crumbling, owing to its coefficient of expansion being the same as that of firebrick. It is stated that the material, which can be applied to a red hot surface, is supplied in two grades, one of which withstands temperatures of 3,200° F., and the other 2,560° F. Apart from these two materials, Sankey and Son supply "Siluma," a porcelain-like silicious fire cement with a higher resistance to heat, and "Graphuma," a neutral cement for use between acid and basic firebricks.

A Useful Man-handled Truck

AN interesting catalogue received from J. Collis and Sons, Ltd., London, deals with a useful make of ball-bearing truck such as might be employed for moving chemicals in amounts ranging up to three tons from one part of a factory to another. This truck consists essentially of two parts; a ball-bearing, four-wheel base, and a demountable platform. Any material to be moved is loaded on to the platform, and the chassis is run into position under it. The action of pulling down the hauling shaft raises the chassis sufficiently to lift the platform from the ground. The advantages of using a truck of this kind are a saving of space and of money. A number of



USING THE COLLIS TRUCK.

platforms can be stacked in a pile, thirteen making a pile five feet high, and the chassis need never be left idle during loading or unloading, but can be in use almost entirely for haulage purposes. It should prove of great utility in moving carboys, tanks, large earthenware vessels, as well as chemicals in bulk and in sacks.

The trucks can be made in any size or shape and in carrying capacity range from 18 cwt. to 3 tons. The accompanying illustrations give a clear idea of how the truck is used. Figure 1 shows the loaded platform; Fig. 2 illustrates the running in of the chassis and Fig. 3 the whole truck in motion; the removal of the chassis is indicated in Fig. 4.

Fisher Self-contained Steam Regulator

IN purchasing a reducing valve or pressure regulator, it is well to remember that one type of valve is not suitable for every service. The Fisher regulator not only reduces pressure, but also regulates it, maintaining a constant pressure on the service side, even though the initial pressure or demand on the service side may vary. Fisher pressure regulators are operated by controlling the relation of pressures on two sides of a laminated metallic diaphragm, which is attached to the main valve. The control of these pressures is accomplished by a small control valve which in turn is operated by service pressure acting on one side of laminated control valve diaphragm. Opposing this pressure on diaphragm is the adjusting spring. The movement of all diaphragms is restricted within their elastic limit, so there is no danger of permanent distortion. The regulator, which is supplied by David Wilson and Co., Brazennose Street, Manchester, is recommended for dead end service where a positive control of the reduced

pressure is absolutely necessary. Like all other self-contained pressure regulators the Fisher will give the best service when the steam, air, or gas is clean and dry. This regulator should prove of interest to users of processes kettles, sterilizing equipment or vulcanising presses.

The Storage of Steam

"Ruths'" Developments in Great Britain

FOR the average chemical works, with a large proportion of the steam generated used for low pressure boiling and general process work, and extreme fluctuations in the demand, the developments now taking place in Great Britain with the "Ruths" Accumulator are interesting. This accumulator can be used for what may be termed "total" accumulation, with sufficient steam stored up to provide enough for the whole works for an hour or two. It also allows of remarkable flexibility. Thus a chemical works with an accumulator installation can operate, with very high steam pressure, efficient pass-out or back pressure turbines for electrical power generation and use of all the exhaust steam, with the provision automatically of low-pressure steam, if necessary, at a number of different pressures, to suit various operations, whilst the fluctuations in the demand are taken easily and the boiler runs all the time at one steady evaporation.

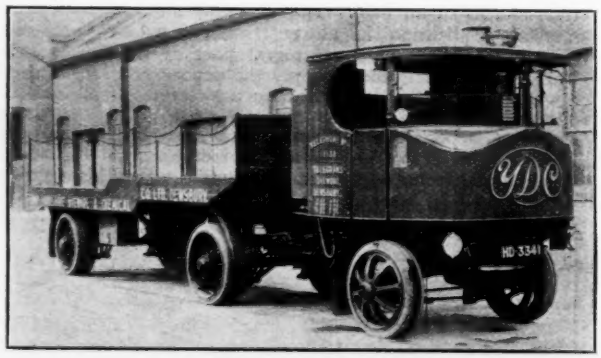
The "Ruths" accumulator is now to be developed on an extensive scale in Great Britain. On January 1 there came into existence a new company, Ruths' Steam Accumulators, Ltd., with head offices at Africa House, Kingsway, W.C.2. The board consists of Mr. F. E. Powell, chairman of the Anglo-American Oil Co., as chairman, supported by Mr. A. J. T. Taylor as managing director, Sir Alexander Kennedy, chairman of the Fairfield Shipbuilding Co., Ltd., of Glasgow, Dr. Johannes Ruths of Stockholm, Mr. J. B. E. Dahlerus, managing director of Electrolux Ltd., Mr. J. Howden Hume, of James Howden and Co., Ltd., of Glasgow, and Mr. W. S. Eyre, a director of Grace Brothers, Ltd. About two years ago there was formed in Great Britain a company known as Fairfield-Howden-Ruths Steam Accumulators, Ltd., with the main object of demonstrating to British steam users the value of the invention, and 15 accumulators are already at work in this country in various "key" industries. Now that the principle has been proved under actual British conditions, the new company has been formed to extend the business, while all the plant and equipment as before is being manufactured in Great Britain.

Essentially, the principle of the invention is a large cylinder nearly filled with water into which all the surplus steam is blown, giving out automatically any desired amount of steam by re-evaporation of the water because of difference of pressure, the main being at a lower figure than the accumulator, the circuit including all the necessary automatic valves. To-day over 350 accumulators are at work in the paper, pulp, textile, chemical, iron and steel, colliery and other industries in many different countries, including Sweden, Norway, Finland, Germany, France, Belgium, and Great Britain.

Road Transport by Steam

The Use of Coke for Lorries

A MOVEMENT is on foot for increasing the use of coke for lorries. A scheme has, in fact, been mooted for gasworks to act as a chain of motor-coke depots, exhibiting special "motor-coke" signs. Coke makes a valuable alternative fuel for the 20,000 steam lorries on the road, burning annually a million and a half tons of steam fuel. Efforts have also just been completed to "lorry-ise" the coal trade in regard to pick-up depots and "branded" supplies at fixed prices, the aim being a road-side service of the petrol-pump station type. It is understood that the use of very cheap "soft" coals has now been eliminated by the known police watch for "black" smoke; thus the competition is confined to the Welsh



A RECENT TYPE OF WAGON.

smokeless coals and the smokeless cokes. In favour of the latter there is the fact that the fuel may be obtainable without transit on costs in convenient bunker-loads locally, whereas the coal must be obtained in large truckloads involving cartage from the local station and storage room. It is felt, however, that the price factor is at present something of a deterrent to the use of coke.

The accompanying illustration shows one of the new models recently put on the road by the Sentinel Waggon Works, Ltd., of Shrewsbury. It is designed to carry 40 barrels, and in order to facilitate loading, the space for each barrel is marked by a circle, this being found to cut down the time taken.

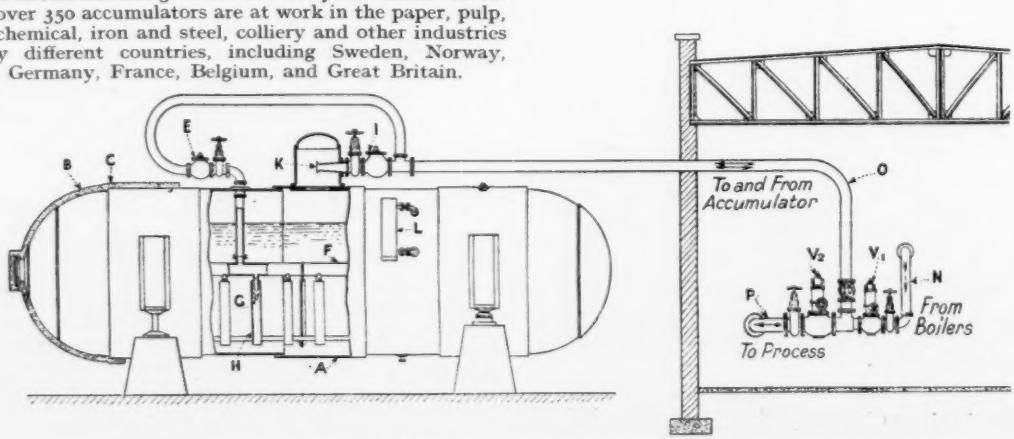


DIAGRAM OF THE RUTHS STEAM ACCUMULATOR.

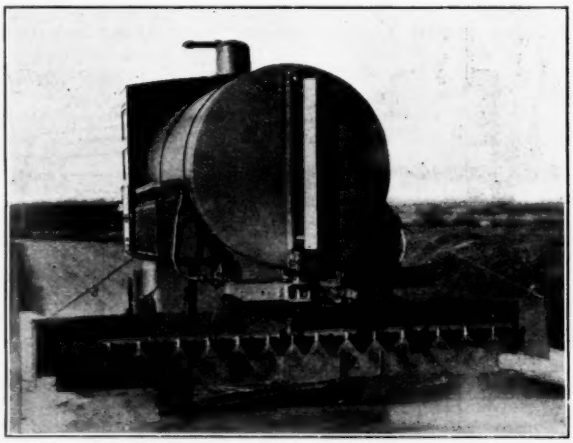
A. Accumulator. B. Non-conductive lagging. C. Outer covering for lagging. E. Non-returnable valve on pipe circuit O. F. Steam distribution pipe. G. Steam nozzles for distribution pipe. H. Sleeves round nozzles G to provide water circulation. I. Non-return valve on steam outlet from accumulator. K. Nozzle for steam outlet from the accumulator. L. Water level gauge. N. Pipe connecting boilers to control valves. O. Pipe for surplus steam to accumulator. P. Pipe for low pressure steam supply to works. V_1. Control valve on pipe N. V_2. Control valve on pipe P.

A New Road-Spraying Vehicle

For Use with Bituminous Emulsions

DURING the past two years the Four Wheel Drive Lorry Co., Ltd., London, have been engaged on the development and perfection of a road-spraying vehicle, particularly the type used for the spraying of bituminous emulsion, and the accompanying illustrations show their latest type machine.

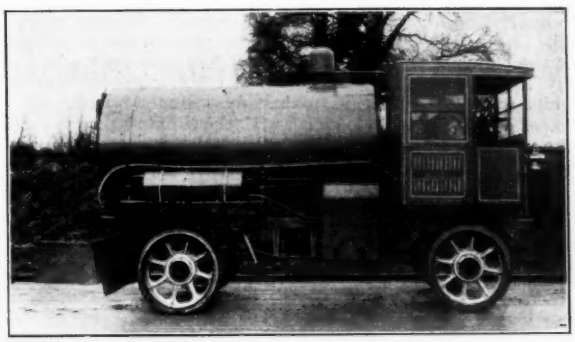
As a constant and definite low speed is required on a vehicle for spraying bituminous emulsion, the F.W.D., with its driving power on all four wheels, has been found very suitable. A special chassis has been developed for this class of work, giving accurate speed regardless of hills or road conditions, and the vehicle is fitted with an automatic governor or speedometer showing the yards per minute travelled and the total number of yards sprayed. The speedometer is so arranged that it only comes into action when the vehicle is in spraying speed with valves open.



END VIEW, SHOWING SPRAYER IN OPERATION AND DETACHABLE SHIELDS.

The equipment consists of 1,000 gallon tank, complete with dome and manhole, and also a power-driven air compressor, complete with cooling tank, governor, etc. Controlling levers for the air compressor, as well as the gauge showing pressure on tank, are located within easy reach of the driver. The spraying valves are controlled by levers on either side of the chassis, and are handled by the operator, who walks alongside the vehicle while spraying. A flexible hose for hand spraying is placed on either side of the vehicle, complete with nozzles.

The drive of the lorry is standard and is fully described in instruction book accompanying each vehicle. All valves and cocks are plainly marked " A," " B," " C," etc., on all vehicles before delivery. The compressor drive is operated from the cab by lever. The gauge in the driver's cab shows the pressure in the tank. The tank can be filled by gravity, pressure, or suction through filling pipe in dome. About six minutes are necessary to create sufficient vacuum in an empty tank, after which the liquid will lift at the rate of about 50 gallons per minute. An emergency float is fitted on the left-hand side of the machine which will destroy the vacuum and prevent liquid from passing into the air compressor if the tank is overfilled. Care should be taken, however, to prevent this from occurring by calculating the number of barrels or amount of liquid going into the tank. The valve, in short, should be considered as an emergency only.



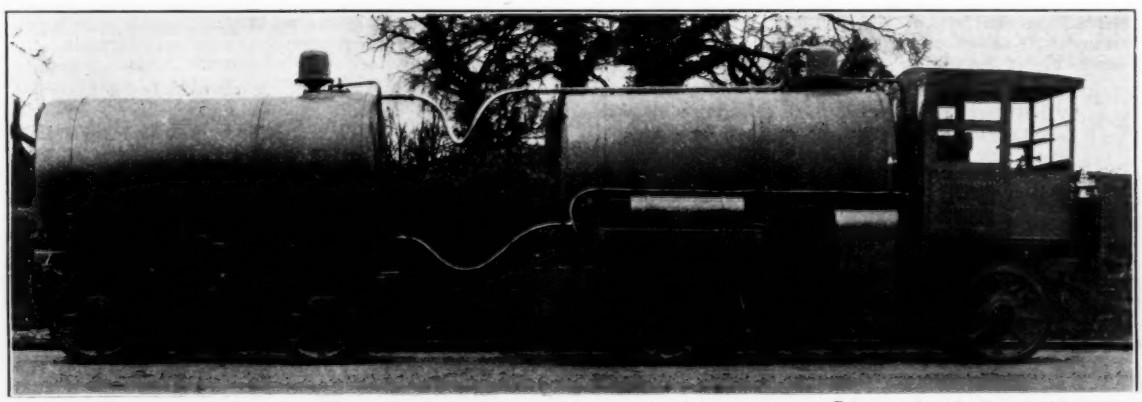
SIDE VIEW OF ROAD-SPRAYING VEHICLE.

Correct spraying speed somewhat depends upon the thickness of coat required, but is generally calculated to be 30 yards per minute. The speedometer in the driver's cab records the yards per minute. The number of linear yards sprayed may be obtained by multiplying the mileage reading of speedometer by 60.

When the machine is stopped for a short time the nozzle should be blown out. At the end of the day all nozzles should be removed and placed in a wire basket in the paraffin tank at the left-hand side of the machine provided for that purpose.

" Pyrex " Glass Catalogue

A PRICE list and catalogue has been received from James A. Jobling, Sunderland, makers of " Pyrex " laboratory glassware, a low expansion borosilicate glass. The glass contains no metals of the magnesia-lime-zinc group, and no heavy metals, which is, of course, important in relation to the possible contamination of liquids. The makers' test to sudden cooling is made by heating a 5 mm. " Pyrex " glass rod in an electric furnace and then dropping the rod into cold water. The glass does not break when cooled by this method from 300° C. The linear coefficient of expansion of " Pyrex " glass is 0·0000032, and it does not commence to soften below approximately 800° C., this being the temperature at which a rod 1 mm. in diameter suspended vertically, elongates of its own weight at the rate of 1 mm. per minute. In addition to these physical qualities the glass possesses high resistant



F.W.D. LORRY AND SPECIAL TRAILER, EACH FILLED WITH 1,000 GALLON TANKS. SPRAYING ATTACHMENT CAN BE FITTED TO TRAILER AND 2,000 GALLONS SPRAYED FROM ONE FILLING.

properties to alkali carbonates, caustic alkalis, acids, ammonia, water and phosphoric acid. The catalogue gives details of many kinds of laboratory glassware such as test tubes, round and conical flasks, evaporating dishes, and distilling flasks.

Mechanical Cleaning of Water Pipes

The Causes of Incrustation

A VERY interesting and important section of engineering, not only for town's water, but also in many cases the supply to industrial establishments, is the mechanical cleaning of water pipe lines. It has been stated that on the average 30 per cent. of the carrying capacity of all water mains of the world over, say, 4 in. diameter is lost because of the internal incrustation, while a large number of mains are losing anything up to 80 per cent. or over in delivery, with the supply in consequence almost entirely stopped. As a result large sums have been spent on new pipe lines that would not have been required if the existing lines had been cleaned out and allowed to operate on 100 per cent. capacity.

Incrustation in water pipes is caused in ways that are many and various, but is chiefly due to iron rust formed by the activity of the iron bacteria *Crenothrix*, animal and vegetable growths, calcium carbonate due to the natural harshness of the water and the decomposition of the unstable soluble bicarbonates, mud and suspended material, and all kinds of foreign substances that find their way in accidentally. When the deposits are of old standing the clearing of the pipes is carried out with an apparatus consisting essentially of three members connected together by universal joints, the first portion in the larger sizes being two cast iron pistons with segmental leather packing discs which fit the pipe and form a comparatively water-tight ring. The other two portions carry scraping and cutting gear consisting of four or more very strong steel blades which continually press—on the principles of a heavy spring—against the inside of the pipes. The pipe is first cleaned out for a short distance by hand, and then the apparatus placed in bodily through one of the hatch boxes, after which the full water pressure is turned on, driving the apparatus in front of it through the pipe like a piston, cutting and cleaning out the material, which emerges at the next hatch box.

With regard to foreign substances, there have been removed from water pipes such varied objects as stones, gravel, clay, chisels, hammers with shaft complete, old boots, pieces of cast iron, lumps of lead (from the jointing), pieces of wood, and various other objects which by some means or other have got into the pipes, while the increase in the carrying capacity of pipe lines after cleaning has been anything from 23 to 80 per cent. Pipe cleaning has been for many years one of the specialities of the firm of Glenfield and Kennedy, of Kilmarnock.

A New Cement-Burning Furnace

A PATENTED cement-burning furnace, which possesses some quite new and apparently valuable features, has recently been evolved in Germany. As can be seen from the accompanying diagrammatic illustration, the furnace is a rotary cone-shaped one, open only at the wider end.

In principle, it is said to be not unlike a furnace previously proposed by Bettinger, in that in both cases the raw material, in a very fine state of division and uniformly mixed, and coal dust, are blown into the incandescent zone of the furnace. In this fine state of division the surface presented to the heat is extraordinarily great, so that calcination, chemical action, and fusion of the products is extremely rapid and complete. The Bettinger furnace, already mentioned, is said to effect a good calcination of the material but fails to produce sintering. For the latter it is necessary not only that the material should be brought to the requisite temperature, but also an appreciable, if very brief, time for the reaction between lime, alumina, and silica, and the fusion of the end products.

The Rotary Chamber

The new cone-like rotary chamber makes it possible not only to obtain a perfect calcination, but also a better sintering than is obtainable in the ordinary rotary cement furnace, and effects this in two stages. The primary sintering occurs while the fine material is in suspension in the furnace, and the secondary sintering is of the same kind as that in the ordinary cement furnace; this secondary sintering may be regarded as a measure of ensuring that no part of the charge escapes being sintered. The hot zone of the furnace, which is about 3 metres in length, can be brought near to the highest possible theoretical temperature. If, therefore, a suitable refractory material is used for the furnace interior lining, the high-grade alumina and other cements can be produced in a very economical way. The return of the fire gases through the form of furnace as shown in the illustration makes it necessary to use a suitable refractory lining to withstand their action upon it.

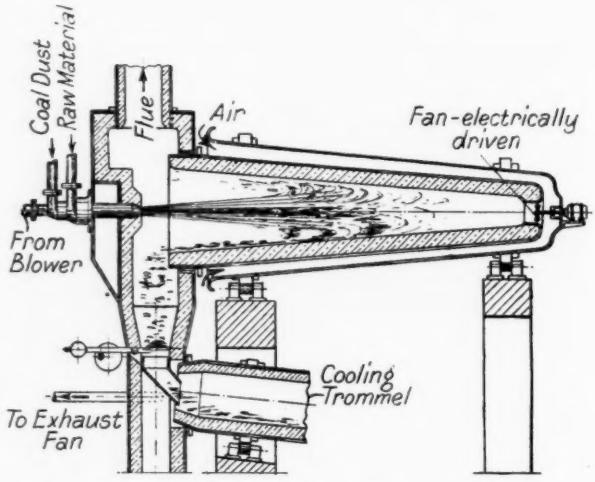


DIAGRAM OF FURNACE.

The quickly increasing diameter of the chamber section due to its conical form produces a corresponding diminishing velocity of the fire gases, and it is said that the dust and small particles of material carried in them are completely deposited on the chamber floor. The temperatures reached are so high that heat transmission through radiation on the stream of entering raw material is such that the material is calcined, etc., in a fraction of a second. The high temperature of the gases leaving the chamber gives the advantage that a much greater thermal efficiency is obtained in their use for steam generation in waste heat boilers, or for drying purposes, than is possible by the relatively low-temperature gases which leave the ordinary rotary cement furnace.

Possibilities of Regulation

A further advantage over the ordinary cement furnace is claimed in the much better regulation possible, which permits a very considerable reduction in the cost of operation. In the usual long cylindrical form of cement furnace the different temperature zones of the furnace fluctuate, according to the relation of the chimney draught to the furnace pressure, in rather wide limits, and this causes a corresponding fluctuation in the bedding of the burning raw material. In the new furnace with its quick-changing furnace section such fluctuations do not occur, as an equilibrium between furnace pressure and chimney draught is reached too quickly.

The fuel consumption of the new furnace as compared with the ordinary cement furnace is about half for the same output of cement clinker, and by strict attention to the regulation can be still less. The power requirements for rotating the furnace are much less, and the total costs of operation are said to be only a fraction of those in ordinary cement furnaces. It is said that the great advantages of this new form of cement burning furnace indicate that it will become widely adopted in the near future. The above description is taken from *Technische Blätter* for January 28.

The Sand Lime Brick Process

A Modern Scientific Method

IT is a sign of the times that over 12 sand-lime or calcium-silicate brick plants are now at work in Great Britain, and obviously the prejudice against this highly scientific method is now dying out. Hundreds of millions of sand lime bricks are being made every year, especially in France, Belgium, Germany, the United States and Canada, and on the same lines, material such as blast furnace slag, ash, clinker and spent shale can be turned into high grade bricks.

It will be remembered the method consists essentially in mixing sand with 5-10 per cent. of its weight in good quality lime which has been thoroughly slaked so that no trace of quicklime is left—an interesting scientific point—together with a small amount of water. Afterwards the plastic mass is passed through a continuous brick press and subsequently the shapes are stacked on a series of small wagons, and heated in a long iron cylinder or autoclave for, say, 4-8 hours by blowing in steam at 120-180 lbs. pressure, resulting in a chemical combination between the lime and the sand, presumably to form hydrated calcium silicates. This binds the mass together, giving an extremely hard smooth brick, resembling natural stone, the exact duration of the heating depending on the steam pressure, while for slag, ash, and clinker, it is only necessary to use steam at atmospheric pressure.

The bricks possess all the advantages of ordinary burnt clay bricks in the way of strength, durability and porosity, whilst there is no sign of bulging, warping, and twisting, so that every brick is a " facing " brick. As a result only a very thin line of mortar is required, and as the bricks themselves are handsome in appearance, with a fine grain and a very light pinkish or greyish colour, depending on the sand used. Also with ash and clinker the colour is deep bluish, like Staffordshire bricks. In fact, the superiority of the sand lime brick is shown by every known chemical, mechanical and physical test to which bricks can be subjected. The British Standard Association have now a standard specification for it (No. 187), price 1s. 2d.

One of the pioneers of the process, originally introduced in 1894, are Sutcliffe, Speakman and Co., Ltd., of Leigh, who at present have plants under construction at Bournemouth and Glasgow, while some of the later installations are the Arun Brick Co., Ltd., at Littlehampton (Sussex), and the Mansfield Sand Co. and the Standard Sand Co., both at Mansfield.

Pulverised Fuel Firing

Reduction in Combustion Chamber Volume

ONE of the remaining problems in pulverised fuel firing, now that wear and tear on the combustion chamber walls and slagging of the ash has been eliminated, is the very large chamber necessary with water tube boilers. Also, of course, no success has yet been achieved with " Lancashire," " Scotch" Marine, and other cylindrical boilers. Thus, for example, in a very large standard water tube boiler of 100,000 to 300,000 lb. evaporation per hour, with the usual row of burners at the top of the combustion chamber, pointing downwards, the total length of the flame is about 30 feet, so that the chamber itself has to be about 50 feet high, with over 100 feet for the entire setting.

It is understood that a remarkable advance has now been achieved by means of a new burner that enables the combustion to be finished in a flame of approximately 10 feet only. As a result, the combustion chamber volume can be cut down by half, with an enormous saving in the capital cost of the setting and a considerable reduction in height. Further, this new burner will take a very high duty, up to 150,000 B.Th.U. per hour—that is 6 tons of coal—so that instead of a row of 10 to 12 burners in the combustion chamber roof, as is now the custom, about 3 or 4 burners are sufficient. The invention is British, being the production of the research department of a firm very prominent in pulverised fuel firing and general power station equipment. The perfected design has now been running for many months continuously in England, and is shortly to come on the market, nearly 50 burners being already on order. Further details will be made available shortly, but the design is on the " turbulent " principle, being applied on entirely new lines, with no bent supply pipes to cause stratification—that is, separation of the air and the finely divided particles of coal. Also when once set by a damper on the secondary air supply no further adjustment is required, complexity in this connection having been hitherto one of the greatest obstacles to turbulent burners. In addition, this burner will take equally well oil or gas, so that we have now got to the stage of pulverised fuel firing in a combustion chamber practically no larger than in modern mechanical stoking, and needing only three or four burners, that will consume indiscriminately any fuel—solid, liquid, or gaseous—in the same combustion chamber if necessary.

Dyestuffs, Intermediates, and Chemicals

The British Alizarine Co. claim to be the oldest firm in the world manufacturing synthetic coal tar colours, as they were originally Perkin and Sons, of Greenford Green, manufacturers of " Mauveine." The latter company was founded by W. H. Perkin, discoverer of " Mauveine." The British Alizarine Co. now specialise in the manufacture of fast colours, particularly those of the anthraquinone type, such as the alizarine series and vat colours which have recently come so prominently before the public notice. A specially pure series of chrome compounds is produced by the company. A recent development in the activities of the firm has been the acquisition of British Synthetics, manufacturers of the Brenthol AS Series. The products of this concern are of great interest to lake and pigment makers, as from the parent beta-oxynaphthoic acid many of the fastest and most brilliant pigments known to the world are prepared. The company make a speciality of supplying intermediates to dyestuff manufacturers throughout the world.

The principal products of the Gas Light and Coke Co. are pitch, creosote, road tar and sulphate of ammonia. They make also a comprehensive range of benzoles and naphthas, toluene and xylenes, phenol and cresols, pyridine bases in close boiling cuts, naphthalenes, and anthracene. In addition to these products the firm is well known for Prussian and bronze blues.

Users of rosin and turpentine will be interested to learn that " Hercules " American wood rosin and American steam-distilled wood turpentine are available in almost unlimited quantities. The Hercules Powder Co. claim for these products that they can replace the corresponding grades of gum rosin and turpentine with advantage in nearly all industries at present using the gum products. Among other fine products manufactured by the Hercules Powder Co. is Yarmor pine oil. The sole agents for the United Kingdom are Langley-Smith and Co., Ltd., 14-20, St. Mary Axe, London, E.C.3.

Brotherton and Co., Ltd., of Leeds, are well-known as manufacturers of various kinds of ammonia compounds, as well as sulphuric, hydrochloric, carbolic, cresylic and picric acids. A full range of coal tar products, including benzol, toluol, high flash naphtha, heavy naphtha, phenol, cresol, creosote, naphthalene, anthracene, pitch, coal tar disinfectants and synthetic tannins are also produced, and the firm is noted for many dyestuffs and intermediate products, and for hydrosulphites and their derivatives for all bleaching operations where a reducing agent is required.

The General Chemical and Pharmaceutical Co., Ltd., of Willesden, are manufacturing an extensive range of laboratory chemicals under the trade name " Judex." Analytical reagents of guaranteed purity are prepared under the supervision of highly qualified research chemists. We understand that the company is giving attention to the production of dyes and dye intermediates in the state of extreme purity which research work requires, and that during the past year the manufacture has been successfully undertaken of a number of rare chemicals which, according to available information, had not previously been manufactured in this country. The production of chemicals for electro-plating constitutes a further branch of the company's activities; an exceptionally pure form of cadmium cyanide is manufactured, and the cyanides and other salts of gold and silver.

The staple products of Cafferata and Co., Ltd., of Newark-upon-Trent, are plaster of Paris of every description, together with Keene's and Parian cements. They also manufacture large quantities of plaster partition blocks and bricks. A

subsidiary manufacture is glue and gelatine, and from the deglued bones calcium phosphate is made. The plaster partitions made by the company have a high resistance to fire.

The Dartmoor China Clay Co., Ltd., are the producers of the famous "Wotter" clays for potting and for the bleaching and paper trades. They are also producers, under licence, of very finely ground colloidal clays, which are being used in increasing quantities in many industries, among them the paint, rubber and tanning trades.

A varied range of raw materials, colours, chemicals, glazes for the pottery, glazed brick, glass, and metal enamelling industries are made by Wengers, Ltd., of Etruria, Stoke-on-Trent. Their products include chemicals of all descriptions, metallic oxides and compounds, white oxide of tin, and tin substitutes, clays, underglaze colours, permanent oxides, vitreous enamel colours, and also machinery of all kinds for use in the above-mentioned industries.

R. D. MacKechnie and Co., chemical merchants, of Gracechurch Street, London, cater especially for the export trade, and are prepared to quote c.i.f. any port for all technical and heavy chemicals. The advantage in receiving c.i.f. quotations is appreciated by export buyers who frequently find difficulty in arriving at cubic content of products which they ship only occasionally.

Laboratory Accessories

A catalogue received from Sibbald, Deans and Co., Ltd., of Glasgow, contains details of the Schwartz sectional system of chemical cabinets for laboratory use, for which this firm are the British agents. The cabinets are an American production and are made on lines following those of sectional bookcases, it thus being possible to enlarge them as necessity dictates. We understand that a seven-unit cabinet has recently been supplied to the order of the British Dyestuffs Corporation, Ltd.

Evans, Adlard and Co., Ltd., have made filter papers for over half a century, and owing to the excellent water supply from the Cotswold Hills, the ash residues are unusually low. Grades of every description are made, in circles, sheets, and rolls suitable for laboratory work and a great variety of industrial purposes. The latter include a special white embossed filter paper for varnishes; white and grey crinkled for oil presses; extra thick white, with holes punched, for transformer oil presses; white and grey circles extensively used in beet sugar factories, etc. A large and regular trade is done at home, and with all the British Overseas Dominions, augmented, we understand, by considerable exports also to U.S.A. and South America.

The Scientific Glass-Blowing Co., of Manchester, has played a useful part in the advances in manufacture of laboratory glassware, first by ascertaining the best qualities of glass for specific uses, and then by making up all kinds of scientific glassware to meet the needs of regular laboratory work, and more particularly modifying this as experience showed was best, and making it, too, for the varied and difficult research work being carried on at our universities and by the research staffs of many important industrial concerns.

Power Plant and Accessories

In the "Simplicity" steam traps, made by the Key Engineering Co., of London, wearing parts, such as levers, fulcrum, thimble valves and seats, etc., are eliminated. There is only one part that moves, a hollow seamless ball which floats freely in the condensate. The ball acts as float, lever and fulcrum and also constitutes the valve, which, being free to rotate, presents a constantly fresh surface to the valve seat and has only a rolling motion on this, without any friction.

Key Asbestos Felt Roofing, a product of the same company, being made of asbestos fibres impregnated with pure bitumen, provides a mineral asbestos roofing, supplied in roll form and fixed like any ordinary bitumen felt roofing. It is of particular value in chemical works owing to its resistance to all forms of acid and practically every sort of chemical which is found in the atmosphere.

In addition to their usual trade in tar stills, the Leeds and Bradford Boiler Co., Ltd., of Stanningley, have two contracts in hand for vertical autoclaves with mixing gear, to be used in connection with artificial silk manufacture. The firm has also made a number of vessels for impregnating electrical apparatus in recent months, and have just received an important contract for a timber creosoting plant for one of the Indian railway companies. In addition to this they are makers of a large number of miscellaneous vessels for chemical and other works, and do a considerable amount of hydraulic presswork for the trade.

Electrical temperature measuring apparatus which should be of particular interest to chemical plant engineers and chemical manufacturers, is one of the specialities of Siemens Brothers and Co., Ltd., of Woolwich. The equipment is reliable, robust and very simple to use, enabling the temperatures of various parts of the plant to be readily ascertained on one conveniently-situated temperature indicator. Temperatures ranging up as far as 1,400° C. may be measured, electrical distance thermometers usually being employed up to 500° C., and from thence thermo-electrical pyrometers up to 1,400° C. Siemens Brothers manufacture a disappearing optical pyrometer for temperatures from 700° C. to 2,500° C.

High resistance to heat and to temperature changes, infusibility, and high reflecting powers are the qualities claimed for Glenboig fire bricks, made by the Glenboig Union Fire Clay Co., Ltd. The bricks are of particular interest to the forge master, who uses intense heats and desires metal free from impurities due to melted fire brick. The makers state that their products are in use in the national arsenals of most of the countries of Europe. The clay used in the bricks is remarkable for its high percentage of alumina and for the almost complete absence of ingredients tending to lower the refractory properties.

A reduction in fuel and smoke to all steam users is claimed by G. F. and M. J. Evans, engineers, of Replingham Road, London, the makers of the Caration fire bars. In a test on a Galloway boiler, 7 ft. 3 in. diameter, 30 ft. long, with furnace flues of 33 in. diameter, and with blow off at 80 lb. steam pressure, the water evaporated per lb. of coal was 7·14 lb., the equivalent of steam per lb. of coal from and at 212° F. being 7·92 lb. The test was carried out using Derby slack and large nuts in equal proportion.

Among the numerous products of W. H. Wilcox and Co., Ltd., of London, are semi-rotary wing pumps, Jones-Wilcox wire-bound hose, and the well-known Penberthy injectors and ejectors.

Tank Wagons for Chemicals

In these days of road transport it is interesting to note that commercial vehicle makers are turning their attention to wagons for the movement in bulk of chemicals. Scammell Lorries, Ltd., well known for their frameless, six-wheel tankers for oil transport, make special models for carrying alkalis, acids, and other liquids. The tank for sulphuric acid is of welded steel, $\frac{3}{8}$ in. thick, with cast iron manhole fittings, grease packed draw-off cock, with an additional foot valve inside the tank. Similar tanks are made for tannic and hydrochloric acids, lined with rubber.

Centrifugal Machines, Mills, and Air Compressors

Centrifugal machines are now employed on a very large scale in the chemical industry for such purposes as the drying of sulphate of ammonia, salt, soda, sugar, nitrates and many forms of crystal. Of the makers of hydro-extractors and centrifugal machines, Messrs. Thomas Broadbent and Sons, Ltd., Central Ironworks, Huddersfield, are one of the largest and the best known. They manufacture some sixty different types of centrifugal machines, each type being made in seven to ten different sizes.

The "Premier" disintegrating and emulsifying mill, manufactured by Burt, Boulton, and Haywood, Ltd., which was the pioneer colloid mill, in its simplest type comprises a cone working in close proximity to a conical seating and almost touching it. The rotor can be adjusted so that a clearance of anything from one-thousandth of an inch upwards may be obtained. Material is fed in by gravitation or by a pump, and it then passes through the narrow space between

the conical surfaces in a thin film. The mills are made for varying purposes and in numerous sizes.

The Westinghouse Brake and Saxby Signal Co., Ltd., of London and Chippenham, make steam-driven air compressors of the standard locomotive type, as well as vacuum pumps, which have found considerable favour in chemical works, breweries, etc., where a limited supply of compressed air is required, because of the ease with which they can be installed in any location, and the small amount of attention required.

The Chesterfield Tube Co., Ltd., specialises in the manufacture of cold drawn weldless steel tubing and piping, cylinders for the storage of compressed gases and air, and also solid drawn steel headers for superheaters and water tube boilers. The improved and modern facilities with which the works are equipped enable the company to offer under the widely known trade name of " CTCO " the best quality cold drawn tubes in sizes varying from ¼ in. to 24 in. internal diameter, each tube being subject to a thorough and exhaustive test before dispatch to comply with the conditions of all recognised specifications.

Optical Apparatus

In control and research laboratories, optical methods of investigation and testing are of growing importance. Adam Hilger, Ltd., of Rochester Place, Camden Road, London, supply a large variety of optical instruments for many purposes. In their pamphlet on " Hilger Instruments in Industry," they point out that in general the spectrometer or the quartz spectrograph is used for detecting traces of metals which would either evade chemical analysis or be extremely tedious to identify or estimate by chemical means. The absorption spectra obtained with the spectrophotometers are very sensitive to traces of many organic substances, so that these two instruments afford tests which experience of the substances concerned can translate into quantitative measurements. The fluorescence spectrograph is an instrument of wide applicability, since most substances exhibit fluorescence in a greater or less degree, many of them doing so in characteristic manners.

The Rayleigh interference refractometers for gases and liquids are instruments very sensitive to changes of concentration or to additions of foreign substances. The Abbe and Pulfrich refractometers are used for controlling the quality of pure substances and have a general use for analysing mixtures of the type A + B. Chemical operations in which there is a continuous change of physical properties towards an end point are most conveniently controlled by the refractometer. This end point need not necessarily be a maximum or minimum refractive index, nor situated at one of the actual measurements, for by plotting the refractive indices as measured, the process may be interrupted at the desired end point without waiting to make a measurement and thereby losing the most favourable moment.

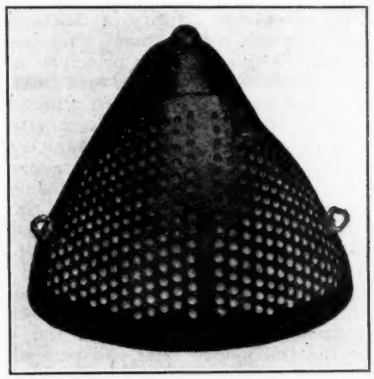
The applications of the polarimeter in the sugar, jam and similar trades are too well known to require description, but the measurement of optical rotation by this instrument has applications to many other industries. The Guild trichromatic colorimeter can be used to measure, specify, and, in most cases, to reproduce the colours of papers, powders, liquids, etc. The Mutochrome has wide applications in the decorative arts, and in all cases where it is desirable to make essays in the distribution of colours in a pattern or design without alteration of the actual design.

Adam Hilger, Ltd., now confine their attention to the manufacture of scientific instruments for research and control. Their sales in 1927 were greater than in any previous year of their history. Among the recent purchasers of their goods are universities and other institutions in Germany, the Argentine, the United States, Japan, Roumania, Holland, Belgium, Lithuania, India, Hungary, Peru, etc.

Safeguarding Against Gas Poisoning

A comprehensive catalogue of gas protection apparatus has been issued by Wallach Brothers, Ltd., in which are shown masks and respiratory apparatus for use in many varieties of gaseous atmospheres. The use of a respirator or mask will prevent the inhalation of dust, metal particles, and poisonous fumes which are often the preliminary cause of consumption and other diseases. For use in chemical works, gasworks, collieries or steelworks the " Evertrusty " oxygen first-aid case is available for instant use in the event of poisoning from water or any other toxic gas.

In the range of masks the firm makes a great variety of apparatus which includes British Army pattern gas masks, safety masks with steam, water, acid, fire and oil proof coverings, and several types of smoke helmets. In another direction hoods and helmets for protection against dust and small solid particles are made. Respirators for use in smoke



The " Evertrusty " Aluminium Respirator.

and fumes are another speciality, a noteworthy example being the " Evertrusty " aluminium pattern, which is recommended for use in chemical works, smelting works and cyanide plants. Welders will be interested in the range of goggles made by the firm. Apart from the anti-gas and dust apparatus many accessories are also provided, such as belts for lifting unconscious men, air pumps, fire extinguishers, stretchers and first-aid medical cabinets.

Propane and Butane

Enrichment of Water Gas

The possibility of utilising propane and butane, materials obtained in large quantities as by-products in the production of natural-gas gasoline, for enrichment purposes in the carburetion of water gas for city distribution is indicated in experiments conducted by the United States Bureau of Mines, Department of Commerce. Mr. W. W. Odell, in a report published by the U.S. Bureau of Mines, states that for a number of years there has been a very appreciable annual increase in the production and recovery of natural gas and natural-gas gasoline in the United States, the latter product being used largely for blending with gasoline from petroleum in the production of motor fuel. On account of the increased amount of oil cracking in the production of gasoline and the accompanying increased percentage of low-boiling constituents in the resulting product, the specifications for the natural gasoline suitable for blending have been altered—that is, the amounts of propane and butane which it can contain have been limited. The result has been that large quantities of the latter materials are wasted because there has been no ready wholesale market for them.

Because of this wastage, and because it is probable that large quantities of these and similar materials will be produced in the near future as a result of the more general use of oil-cracking processes, a study was made by the Bureau of Mines of the suitability of these materials alone or in mixtures for use as gas enricher in the carburetion of water gas for city distribution. During the course of the Bureau's tests, using these hydrocarbons as a gas enricher in the commercial production of carbureted water gas in a small city gas works, there were no complaints of service or quality of gas supplied to consumers. The quality of the gas made and distributed was readily maintained at the approved standards.

Detailed information in regard to these tests is contained in Serial 2840, " The Carburetion of Combustible Gas with Butane and Propane-Butane Mixtures with Particular Reference to the Carburetion of Water Gas," copies of which may be obtained from the United States Bureau of Mines, Department of Commerce, Washington, D.C.

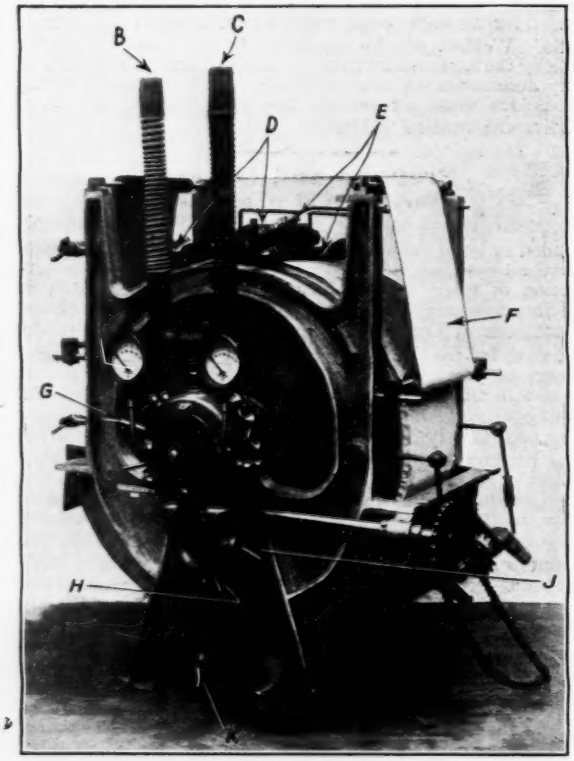
Continuous Rotary Filtering Machines

Paper Before Hull Chemical and Engineering Society

At a meeting of the Hull Chemical and Engineering Society, Mr. Wolfe Keene (of Wolfe Keene and Co., Hull) read a paper on "Continuous Rotary Filtering Machines."

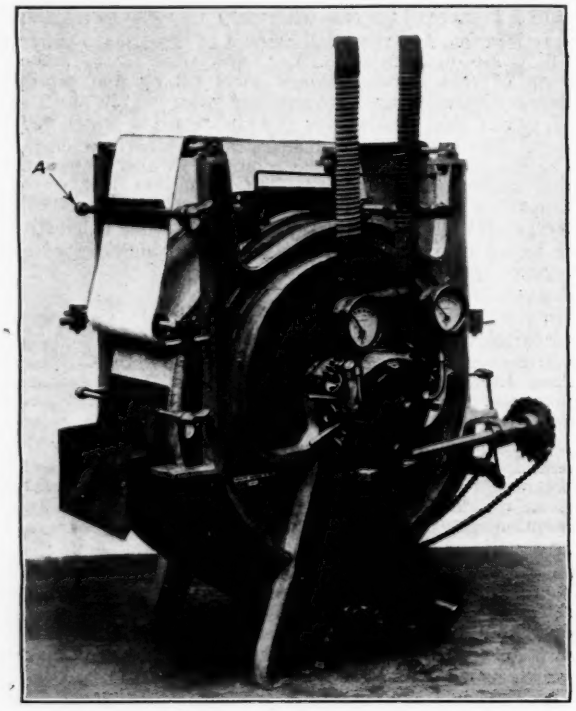
Mr. Keene expressed the opinion that the rotary vacuum filter was the coming type of industrial filter. Discussing the history of this type, he said that the idea of a rotary perforated drum covered with a filter-cloth made its appearance in the latter half of the nineteenth century in Belgium. This was then known as the single compartment filter, and was still referred to as such. Although old in principle, it was barely within the last ten years that it had met with greatly increased favour for many processes. The modern rotary filter was a multiple compartment machine, each compartment being independent and separate. A good deal of the early research work on this subject had been done in Germany, but great credit was due to Oliver, who, in 1908, by his control valve and spiral winding of the drum, to hold down the filter-cloth and to prevent the scraper cutting the cloth, effected a considerable simplification. This laid the foundations of the success of the Oliver continuous rotary filter.

Mr. Keene then described the manner of operation of a rotary vacuum filter, the construction of the valve, the accessory equipment and the lay-out of the plant. The advantages of the continuous filter, he pointed out, were many, and probably the most important was that it was fool-proof. Any labourer could tighten up grease cups, oil the bearings of a slowly revolving filter, and see that the discharge hopper did not jam. The labourer would have nothing to do with the time of filtration, with the extent of washing, or with the manipulation of valves in order to hold positive pressure during transference of liquors. The universal valve would do everything for him automatically. Mr. Keene then dealt with cake washing, cake discharging, and other operations.



Wolfe Keene's Continuous Rotary Filter: (B) Water Supply for Cleansing Filter Cloth; (C) Steam for Sterilising when Required; (D) Compressor Rolls; (E) Water Supply for Washing Cake; (F) Compressor Belt; (G) Vacuum Release for the Release; (H) Filtrate Outlet; (J) Wash Effluent Outlet; (K) Agitator.

Among recent developments to which reference was made was the paddle type filter introduced by the Stream-Line Filter Co., which employed the principle of edge filtration. This was done by arranging filtering surfaces radially, so that the form of the filter somewhat resembled a paddle wheel. The Dorr Co. also had many new and interesting features in their continuous vacuum filter.



Wolfe Keene's Continuous Rotary Filter: (A) Shows Method of Cake Discharge When Operating Thin Dry Cakes.

In the accompanying illustrations are shown various features of the continuous rotary filters produced by Wolfe Keene and Co., of Hull.

Directory of Paper Makers

Marchant Singer and Co. have just published the 1928 edition, revised and brought up to date, of their *Directory of Paper Makers* of Great Britain and Ireland (pp. 233, 5s. 6d.). The contents are grouped under the following headings: an alphabetical list of paper and millboard makers of Great Britain and Ireland, giving names, addresses, products, machines, etc.; a list of paper enamellers, surfacers, varnishers, gummers, embossers, etc., and manufacturers of foil papers, waxed papers, cards, pasteboards, pulpware, etc., not being actually makers of paper; a list of paper makers' representatives and paper agents; London wholesale stationers; lists of mills, under three headings—numerical—alphabetical, with names of occupiers—and in counties alphabetically, with maps; a classification of makes of paper, with makers' names; trade designations used by paper makers, wholesale stationers, etc., divided into actual watermarks and trade names (not being actual watermarks); addresses of firms referred to in lists of trade designations, etc.; paper trade customs; standard names and sizes of papers and boards; and sizes of paper. This well-known and valuable publication continues to be quite indispensable to all who are interested in paper or in the paper trade.

Ultra-Violet Radiation in Industry

Interesting Paper by Mr. A. A. King

A MEETING of the Chemical Engineering Group of the Society of Chemical Industry was held in the rooms of the Chemical Society, Burlington House, London, on Friday, March 23, when Mr. Alfred A. King (of Albright and Wilson, Ltd., chemical manufacturers) read a paper on "Ultra-Violet Radiation in Industry." Professor E. C. Williams (chairman of the Group) presided at the commencement of the proceedings. He said that the subject with which Mr. King was to deal must be new to most chemical engineers. They did not know where the power of ultra-violet radiation was going to lead in industry. One or two specific and startling instances had recently been made public, particularly in the direction of vitamin work by British Drug Houses, Ltd. Recently he had been speaking to Sir Alfred Mond, who had said that he proposed to instal ultra-violet light as one of the necessary concomitants to the organisation at the Imperial Chemical Industries headquarters in London, where sunlight was not so common as it might be.

Departure from England of Professor Williams

At this point Professor Williams, who had to attend another function that evening, asked Mr. H. Talbot (the vice-chairman of the Group) to preside. Before Professor Williams left the meeting, however, the members accorded him a vote of thanks for his past work on behalf of the Group, and expressed to him their heartfelt wishes for his welfare and prosperity in California, where he is to undertake important research work in the near future. The resolution was proposed and seconded by Mr. C. S. Garland and Mr. H. Talbot respectively. Professor Williams, in returning thanks, said he hoped to be back in this country frequently, and also to have an opportunity to read a paper before the Group on a future occasion.

Mr. A. A. King then read his paper. He stated that difficulties not yet overcome in engineering practice limited the radiation available for industrial purposes to wave lengths between 2,000 and 4,000 Angstrom units. It was most difficult to state in general terms what one might expect ultra-violet radiation to do, and in what direction a chemist might look for its help in industry. Ultra-violet radiation above or below narrow limits of wave length might bring about quite different chemical reactions. The same applied to the intensity of the radiation, and from the chemical engineer's point of view it was with the intensity of radiation rather than its wave length limits that he would be concerned. The total amount of energy which could be employed as ultra-violet radiation was extremely small when compared with quantities of other types of energy employed in industry.

It was therefore unlikely that ultra-violet radiation would be useful for any reaction involving its use in large quantities as a source of energy. Of the total electrical energy put into the best type of mercury vapour lamp only 20 per cent. was recovered as ultra-violet radiation. It was much more likely to be used as a catalyst or activator of catalysts, as an aid to sustaining chemical reaction, or for the production of minute quantities of compounds either being added to, or eventually removed from, the bulk of some other compound.

Use of Ultra-Violet Light in Analysis

After dealing with the actual technique of the production of ultra-violet radiation, Mr. King went on to speak of a method of testing the products for arsenic by means of ultra-violet radiation which he had worked out. The test depended on the fact that certain substances, on exposure to ultra-violet radiation, fluoresced visibly. This test was described in detail, and Mr. King stated that it had been standardised in the laboratories of Albright and Wilson. Another application of the same phenomenon was being tried for the purpose of distinguishing between eggs of various ages. Finally, Mr. King dealt with the therapeutic value of ultra-violet light to workers in industry.

In the discussion, Dr. S. P. Schotz, Mr. F. A. Greene, and Mr. C. S. Garland raised the question of the sterilisation of water by means of ultra-violet light. Mr. King replied that the cost of sterilisation by this means was considered to be about one-and-a-half times as costly as sterilisation by means of chlorine. Much depended, however, on the installation. Dr. W. R. Ormandy discussed the production of chemical reactions by bringing together, by the application of wave lengths of the order of 10 to 30 metres, gases which were normally inert to one another. It had been found that quite a large number of chemical reactions which could be brought about between two gases by means of certain catalysts could be brought about also by passing the gases through tubes placed in a helix and subjected to radiation by wave lengths of the order of 10 to 30 metres. Dr. S. G. Barker discussed the use of ultra-violet light for the analysis of textiles, for detecting mineral oils, mildew, etc.

Dyers and Colourists' Dinner

Presentation of Perkin Medal to Dr. Schmidt

THE annual dinner of the Society of Dyers and Colourists was held on Friday, March 23, at the Midland Hotel, Manchester, Dr. Levinstein, the president, occupying the chair. The principal guests were Sir Josiah Stamp, of I.C.I., Dr. Robert Schmidt, of Elberfeld (the Perkin Medallist) and Mr. Ernest Hickson, to whom the Society's medal has been awarded for exceptional services rendered to the Society.

The toast of the Society was proposed by Mr. W. E. Thompson, the president of the Manchester Chamber of Commerce, who said it was very seldom now that Manchester merchants were told that in the selection of colours, in finish, or in anything that had to do with the dyeing of cotton textiles, the British product was inferior to the continental. In that respect there had been a great improvement in recent years, and he attributed it very largely to the work of the Society. In replying to the toast, the President said the most important piece of work the Society had undertaken was the Colour Index. The first impression of it was now exhausted and it was being reprinted. This success was very gratifying. Great progress was being made in the investigation of the problem of fastness to light. In that work the Society had the support of the Research Associations of many industries—linen, silk, cotton, wool, and laundry—and of the American Association of Textile Chemists. He regarded this as work of the utmost importance; the effects of light on fabrics and dyestuffs had been extraordinarily little studied in the past. It was known that fabrics tendered when exposed to light, and that dyestuffs faded, but what really happened was only beginning to be studied now.

Sir Josiah Stamp on Improved Methods of Application

The toast of "Dr. Robert Schmidt, the Perkin Medallist," was proposed by Sir Josiah Stamp, who gave a résumé of Dr. Schmidt's career. The medal had been awarded to him for epoch-making discoveries in anthraquinone derivatives and dyestuffs prepared therefrom. Sir Josiah Stamp said it was a commonplace that chemistry had revolutionised the economic community. It was equally true, though not so obvious, that economic developments had revolutionised chemistry in this sense—that the conditions under which research work was prosecuted were vastly different. A hundred years ago the inventor or discoverer had to start from the beginning, ignorant of what his predecessors had tried to accomplish and how they had failed; no record of his own failures was preserved; if he succeeded he had to run about to find someone who would vouch for him and provide him with financial backing.

In these days, in the research departments of great combines, all results were carefully recorded and each worker could build upon the failures of his predecessors. When success was obtained it received immediate scientific sanction and was got into working operation as quickly as possible. There was ample financial support from the outset. For small concerns there were the Research Associations. There was still room for improvement, however, in the communication of results to industrial members and the actual application of the results in workshops. The development of channels of common information, as a clearing house between different associations, and the establishment of funds for speeding up industrial application, were desirable.

In replying to the toast, Dr. Robert Schmidt (who spoke in German) remarked that Great Britain had always evinced the greatest interest in fast dyestuffs, and was always the first to adopt their use in practice without considering the question of cost as compared with dyestuffs of inferior fastness.

A Bookman's Column

THE Cambridge University Press announcements of books arranged for include a volume on *The Biological Chemistry and Physics of Sea Water*, by Mr. H. W. Harvey, hydrographer at the Laboratory of the Marine Biological Association, Plymouth.

* * *

To the steadily growing literature of the fertiliser problem Mr. Frank Ewart Corrie, B.Sc., adds a practical volume on *Manures and Manuring* (Chapman and Hall, pp. 168, 5s.). It is described as a handbook for practical farmers, students, and others, and its aim is to state, in a simple way, the more important principles underlying the practice of manuring.

* * *

A hearty welcome has been extended, on all hands, to Benn's Sixpenny Library. Reviews have already appeared in this journal of *Chemistry*, by Dr. P. E. Spielmann, and *The Atom*, by Professor E. N. da C. Andrade. A recent addition to the series is *The Structure and Properties of Matter*, by Dr. W. A. Caspari (pp. 77, 6d.), in which are discussed gases, liquids, solids, solutions, and colloids. The author deals with the physico-chemical properties of matter in a simple, straightforward, and attractive style, and those who have already enjoyed the two earlier volumes mentioned above will doubtless desire to renew their acquaintance with the series through the medium of Dr. Caspari's contribution.

* * *

The "Hutte" *Taschenbuch für den praktischen Chemiker* (practical chemist's pocket book) has just been published in its second edition by Wilhelm Ernst und Sohn, of Berlin (pp. 898, linen covered 28 Rmk., leather 31 Rmk.). The first section has articles on chemistry in world industry; heating, ventilation and illumination of works; dangers in chemical industry and safeguards against them; prices, etc. The next deals with the properties and constants of elements, compounds and substances, the latter including wood, insulating materials, glass, metals, alloys, etc. Then follow sections on the states of aggregation (solid, liquid, gaseous and colloid); on plant; on physics and physical chemistry; and finally on chemical technique. This German book is very thoroughly planned, and contains a large amount of useful data and information.

* * *

For many years past, a vast accumulation has been made of facts in regard to the structure of organic compounds, but the advance of our knowledge of the nature of organic reactions has been less satisfactory. The physical chemists are now beginning to tackle this aspect of organic chemistry, and Professor F. O. Rice, of Johns Hopkins University, has written a very interesting account of *The Mechanism of Homogeneous Organic Reactions from the Physical-Chemical Standpoint* (American Chemical Society Monograph Series. New York: The Chemical Catalog Co. Pp. 217. $5.) Among the subjects dealt with are reaction velocity, addition compound formation, isomeric change, hydrolytic reactions, reactions of aliphatic hydrocarbons and of benzene and its derivatives, and various general and special organic reactions. The perusal of this book lends a new and fresh interest to many well-worn problems of organic chemistry.

* * *

Of considerable current interest is *Oil and Retortable Materials*, a handbook on the utilisation of coal, torbanite, cannel and oil shale, by G. W. Halse (Charles Griffin and Co., pp. 146, 7s. 6d.). The author outlines the essential points of the various processes for obtaining liquid fuels, and relying upon his experiences he has co-ordinated and correlated the many different procedures by which liquid fuel is procured so that they may be seen in true perspective to one another as well as to liquid fuel in general. The chapter headings are: fuel, coal, torbanites and cannels, oil shales, correlation of fuels, retorting, distillation products, and future liquid fuel supplies. In view of the large number of materials to which the various processes for the production of fuel are applied, and of the vast amount of literature published on the subject, the perusal of this book will help to clear the minds of many of those who, in the author's words, "are interested in one way and another in this subject but are unfamiliar with its technical details."

Claim for Alleged Libel Dismissed

The Texas Oil Co.'s Action Against Milk Firm

ON Thursday, March 22, in the King's Bench Division, the hearing was resumed before Mr. Justice Swift and a special jury of a claim for damages for alleged libel, made by the Texas Oil Co., Ltd., against the West Surrey Central Dairy Co., Ltd.

Mr. J. W. Holmes, accountant for the plaintiff company, stated that in 1923 the company sold 1,287 tons of "Texaco" at a profit of £1,633, and in 1924 7,295 tons at a profit of £5,998. In 1926, after the defendants had written their letter to the Somerset County Council, the sales dropped to 292 tons, and showed a loss of £129.

Mr. Rayner Goddard contended that he had no case to answer, because the alleged libel did not reflect on the plaintiff company as a concern, but merely amounted to a disparagement of plaintiffs' "Texaco." Defendants, as ratepayers, had asked the Council, to whom they paid rates, to protect them from contamination of their goods by the "Texaco" that was being sprayed on the roads, and they made that request, and echoed the sentiments of numerous other trades, without malice and on a privileged occasion.

His Lordship, after hearing Mr. Pritt, said if the defendants honestly believed that their milk had been damaged they were entitled to complain to those using "Texaco" on the road. He thought the letter was quite properly written to the Clerk to the County Council, as they were responsible for the upkeep of the roads in the district. There was no reflection on the oil company as a business concern. He thought the occasion of the letter was privileged, and he was not satisfied that there was any evidence of malice to be imputed to the defendants. There was no defamation of the plaintiffs. No damage had been proved by the plaintiffs. Respondents had no cause of action and the claim would be dismissed.

A counter-claim by the dairy company for damages to milk was withdrawn and the case dismissed, without costs.

Ramsay Memorial Laboratory Fund

Nearly £24,000 to Date

THE chemical engineering, building and equipment fund committee of University College, London, of which Sir Alfred Mond is chairman, Sir Robert Waley Cohen vice-chairman, and Sir David Milne-Watson hon. treasurer, recently issued an appeal for a capital sum of £50,000 for the extension of the Ramsay Laboratory of Chemical Engineering and for its equipment. The response up to the present time has produced £23,555. Among the subscribers are:—Imperial Chemical Industries, £10,000; the Shell Group, £5,000; the Gas Light and Coke Co., £5,000; Dunlop Rubber Co., £1,000; Reckitt and Sons, Ltd., £1,000; British Aluminium Co., £250; British American Tobacco, Ltd., £250; South Metropolitan Gas Co., £105; Sir Edward Brotherton, £100; Mather and Platt, Ltd., £100; the Worshipful Company of Salters, £52 10s.; Professor E. C. Williams, £50; and other subscriptions, £648 2s. 11d.

In addition to the capital fund for the building and equipment, an income of £6,000 a year is required for the maintenance of the Laboratory. Towards this £3,191 has already been promised for the first five years, and £2,600 for the second five years. The committee is anxious to complete both funds as speedily as possible in order that the new building may be proceeded with. Donations and subscriptions may be sent to Sir David Milne-Watson, at University College, Gower Street, London, W.C.1, who will be glad to supply any further particulars.

An Interesting American Tariff Action

FIVE tons of quinine have been seized by the United States Federal authorities, in what is stated to be the first operation of the Wilson Tariff Act of 1894, which was passed to prevent monopolies from entering the United States to the prejudice of home manufacturers or importers. The goods were seized in the Dutch warehouse of R. W. Greeff and Co., and at the same time the Attorney-General's office issued a statement that the Government had instituted two actions under the anti-trust laws. The first demands the dissolution of an alleged Dutch quinine monopoly in the United States. The other, however, was not explained.

Indian Chemical Notes

[From Our Indian Correspondent.]

Artificial Manures in Bombay

The Agricultural Department, Bombay, reports that the use of artificial manures in the Presidency is now growing common. The most successful manure is sulphate of ammonia for sugar-cane and castor cake for cotton. There are various experiments and demonstrations still going on. The Department is frequently approached by bodies representing large commercial interests in certain artificial fertilisers to make tests on their behalf, under conditions prevailing in the Presidency, and the Department is always pleased to do so. As a part of this policy, experiments have already been arranged with nitrate of soda, calcium cyanamide, phosphate of ammonia, "radio-phos" (a finely ground rock phosphate), and phenania phosphate. So far, the really successful materials have been sulphate of ammonia (very widely), and nitrate of soda (in a number of cases), while others are in the trial stage.

Dyes in Madras

The figures of Madras sea-borne trade during 1926-27 show improved imports of dyes and colours totalling a value of Rs. 40 lakhs as against Rs. 27 lakhs in the previous year. Alizarine and aniline dyes both increased in quantity very considerably, and this increase is said to be due to the improved selling arrangements of the German interests in the Presidency, and to the direct imports of dyes to Madras instead of through Bombay as in previous years.

Punjab Paper Mills

The Governor of the Punjab laid the foundation stone of the Punjab Pulp and Paper Mills Co., the construction of which is expected to be finished by August. The Governor, in his speech, spoke very encouragingly of the project, and hoped that it would promise an important market for Sabai grass in the Kalesar forest, and in those of the neighbouring States. It will also afford employment to a very large body of labour in cutting and transporting grass, quite apart from the considerable number whom it will employ permanently in the mills.

Indian Paper Industry

That the Indian paper industry, which was some time ago in a precarious condition, has improved very considerably since protection was granted, is evident from the results of the working of the Bengal Paper Mills. These mills have been able to make a good profit during year ending June last, and after reserving considerable amounts for depreciation, reserve, extensions to plant, etc., have declared a dividend of 10 per cent. Their report states that the mills are working satisfactorily and that there is a demand for the full output at prices which, although tending to shrink, have permitted a fair margin of profit. The management has felt the immediate necessity of modernising some of the power plant at a very considerable expenditure, and the work will be carried out this year.

The Petroleum Industry

The Indo-Burma Petroleum Co. has decided to extend its activities and undertake new work in the petroleum industry, and with that object in view has now issued a prospectus inviting subscription to its newly-issued shares. The new work will consist of the drilling and developing of the area which is being reclaimed by the River Training Wall at Lanywa, and the extension and the improvement of the refinery at Seik Seikkyi, and of the distributing facilities throughout India and Burma. A well-considered programme has been drafted and will be carried out as soon as the capital necessary for the purpose has been raised.

Indian Concrete Association

An association known as the Concrete Association of India has been formed in Bombay with a view to educating and assisting the public in the proper use and treatment of concrete, and to popularise it for construction. The offices of the Association will be opened at the Telephone Buildings, Home Street, Bombay, and Mr. Alan Moncrief has been appointed director and manager. Other centres will be opened in due course, and at each centre engineers, expert in the use of concrete, will be in charge to give free practical assistance and advice in all concrete problems. The Association will also maintain a reference library. S. G. W.

Chemical Matters in Parliament

Diseases in Artificial Silk Works

Mr. Maxton (House of Commons, March 22) asked whether there were any facts to show that, in the countries where the artificial silk industry had been established, any definite trade diseases had been developed, and that special precautions were necessary to prevent them?

Sir W. Joynson-Hicks in reply, said that as the hon. member knew, it was a new industry. His inspectors were watching it most carefully, and all that he could say at present was that they have no evidence to establish its being dangerous in any particular.

Dead Sea Salts (Concession)

Answering Colonel Howard-Bury (House of Commons, March 26), Mr. Amery stated that the results of the negotiations with Major Tulloch and Mr. Novomeysky were still under examination by the Palestine and Transjordan Governments. As he had already stated, no concession had yet been granted.

Low-Temperature Carbonisation

In answer to a question by Mr. C. P. Williams (House of Commons, March 27), Commodore D. King, stated that no tests had been carried out by the Mines Department on the low-temperature carbonisation of North Wales coal. In a reply to Mr. G. Hall, he stated that the results of large scale tests on Somerset coal were being prepared for publication.

Ethyl Petrol Inquiry

Sir Kingsley Wood (Parliamentary Secretary, Ministry of Health), replying to a question by Lieut.-Commander Kenworthy (House of Commons, March 28), said that the composition of the committee on ethylated motor spirit was now practically complete, and it was hoped to make an announcement in the course of this week. The terms of reference were: To inquire into the possible dangers to health resulting from the use of motor spirit containing lead tetraethyl or similar lead-containing compounds, and to report what precautions, if any, are desirable in connection with the use or handling of such motor spirit. It was impossible to say when the report might be expected.

Psychological Investigations in Chemical Works

The National Institute of Industrial Psychology has been carrying out much interesting investigatory work during the past year into the value to industry of the scientific study of the human factor, and the serious consequences of neglect. There has been a growing demand for the application of the Institute's methods in the general organisation and lay-out of factories. As regards chemical works, the assistance of one of the Institute's investigators has been requested during the erection of one of the largest plants in the country. The recommendations so far made and adopted include the establishment of a planning department. Its function is to forecast and to record the progress made in all sections of the constructional work. By the programmes and forecasts thus obtained, the activities of the drawing office, purchase department and construction department will be fitted to a common scheme. The progress records are being used to reveal likely difficulties, and as a basis for framing more accurate programmes of future work. Changes have been introduced so as to eliminate time waste in the transport and delivery of construction materials. The investigator has also surveyed the chemical processes of the plant with a view to installing selection tests for workers, and he has likewise systematised the study of accident and sickness incidence. The services of a second investigator have since been requested, and he has begun work on certain problems relating to stores organisation.

Edinburgh Section of S.C.I.: Annual Meeting

The annual business meeting of the Edinburgh and East of Scotland Section of the Society of Chemical Industry was held on Thursday, March 22, in the hall of the Pharmaceutical Society, York Place, Edinburgh. The following officers were elected for the year 1928–29: chairman, Major R. Bruce, M.C., F.I.C.; vice-chairman, Dr. W. T. H. Williamson; hon. secretary and treasurer, Mr. W. M. Ames; committee members, Dr. J. Rutherford Hill, Mr. A. M. Cameron, Dr. Bain, and Mr. Guy. At the close of the meeting a presentation was made to Dr. Williamson, in recognition of his services as honorary secretary to the section.

From Week to Week

THE INTERNATIONAL BUILDING TRADES EXHIBITION will be held at Olympia, London, in the period April 13–26.

AFTER FORTY-TWO YEARS SERVICE with J. and P. Coats, Paisley, Mr. Oswald Wilkinson, head of the staff of the Fergusiie Dyeworks, has retired.

DR. POLLAK, editor of the Czecho-Slovakian journal *Der Gerber*, has been appointed Associate Professor in leather chemistry and tanning materials at Prague High School.

A BED OF PHOSPHATE DEPOSITS, estimated to contain 18,000,000 tons, near Es Salt in Transjordan, is stated to have been discovered qy investigators sent there on behalf of a British company.

A SCHEME FOR THE CREATION of a Colonial Agricultural Scientific and Research Service, available for the requirements of the whole Colonial Empire, is outlined in a White Paper, just issued.

A SPECIAL MEETING OF THE Institution of Gas Engineers will be held at the Institution of Electrical Engineers, London, at 11 a.m. on April 22, for the approval of the terms of application for a Royal Charter.

AT THE INVITATION OF THE AUSTRALIAN UNIVERSITIES, Sir John Russell, director of the Rothamsted Experimental Station, will shortly visit Australia, to lecture on the application of science to agriculture.

A MEMORIAL TABLET to be unveiled in Oxford next month will commemorate the centenary of the death of Mr. Sadler, Inspector of Chemistry to the Admiralty, who made the first flight in a balloon in this country in 1784.

THE REPORT OF A PRELIMINARY INQUIRY into an explosion from an iron boiler stop valve chest at Irwell Bleach Works, Pendleton, Manchester, in which two men were injured, states that the cause of the explosion appears to have been a water hammer.

SIR HARRY MCGOWAN is to be one of the members of a mission to leave for Australia in August to promote trade between the Commonwealth and this country, and to confer with the leaders of Australian commerce on the development of Australian resources.

MR. F. C. FAIRHOLME, a director of Thos. Firth and Sons, Ltd., has been chosen as one of the delegates to represent the Federation of British Industries in the return meeting with the General Fascist Confederation of Italian Industries, to be held in Rome, April 16 and 17.

THAT HE HAD WRITTEN a scurrilous letter to Lever Brothers after he had been released on bail and had given an undertaking not to publish libels was a statement made at Old Bailey on Wednesday in the case of George Harvey Bagnall, soapmaker, charged with publishing defamatory libels.

THE COUNTY EXECUTIVE of the Yorkshire (North Riding and South Durham) county branch of the National Farmers' Union recently paid a visit to the works of Synthetic Ammonia and Nitrates, Ltd., at Billingham, Dr. R. E. Slade explaining the aims and the policy of the company.

MR. C. GORDON SMITH, M.Sc., at present chief assistant in Alfred Holt and Co.'s laboratories, Liverpool, has been appointed chief chemist to the Salt Union, Ltd., of Winsford, Cheshire, in place of Dr. W. E. Gibbs, who has been appointed to the Ramsay Chair of Chemical Engineering in the University of London.

MR. A. C. ORTHMANN, chief chemist to the Pfister and Vogel Leather Co., of Milwaukee, has been appointed chairman of the Milwaukee Section of the American Chemical Society. He is at present secretary of the Leather and Gelatin section of the Society, and is a Councillor of the American Leather Chemists' Association.

A CIRCULAR LETTER ISSUED by the International Holding and Investment Co., Ltd., to shareholders states that it has disposed of the British Celanese royalty and debentures, but on the other hand it has substantially increased its holding in the Fabrique de Soie Artificielle de Tubize. It has also granted a credit of $4,000,000 to that company in return for a royalty on its turnover of ½ per cent. for 1928 and thereafter of one for cent. for five years.

UNEMPLOYED INSURED PERSONS at February 20, in Great Britain and Northern Ireland, in chemicals manufacture, numbered 5,631 (males, 4,830, females, 801); in explosives manufacture, 1,092 (males 763, females 329); in paint, varnish, japan, red and white lead manufacture, 793 (males 642, females 151); and in oil, grease, glue, soap, ink, match, etc., manufacture, 4,668 (males 3,842, females 826). The percentages unemployed were as follows (increase or decrease as compared with February, 1928, given in brackets): 6·1 (decrease of 2·3), 6·0 (decrease of 1·5), 4·4 (decrease of 0·9), and 6·1 (decrease of 1·7).

UNIVERSITY NEWS.—*Edinburgh:* The Senatus Academicus has resolved to confer the honorary degree of LL.D. on Professor F. G. Donnan, Professor of Inorganic and Physical Chemistry at the University College, London, and on Mr. Henry S. Wellcome, founder of the Wellcome Research Laboratories at Gordon College, Khartoum.—*London:* Dr. E. E. Turner has been appointed to the University Readership in Chemistry, tenable at Bedford College. The title of Reader in Physical Chemistry in the University has been conferred on Dr. Samuel Sugden in respect of the post held by him at Birkbeck College.

FATAL INDUSTRIAL ACCIDENTS reported during February included four in chemical factories.

THE FIFTH INTERNATIONAL COLONIAL FAIR at Antwerp will be held this year from September 8–30.

IMPERIAL CHEMICAL INDUSTRIES, LTD., has made a donation of £1,000 to the Lord Mayor of London's fund for the Douglas Haig Memorial Homes.

DISEASES OF OCCUPATIONS reported during February in Great Britain and Northern Ireland, under the Factory and Workshop Act, included four cases of aniline poisoning.

THE WORKS of the Calico Printers' Association, Ltd., at Thornliebank, Glasgow, were completely gutted by fire on Friday, March 23, and a large quantity of machinery was destroyed.

HOWARDS AND SONS, LTD., of Ilford, announce that their works, warehouses, and offices, will be closed for the Easter holiday from Thursday evening, April 5, to Tuesday morning, April 10.

EXPORTS OF CHEMICALS and allied products from the United States fell 8 per cent. in value in January, 1928, to $14,665,000, and imports increased 2 per cent. to $18,000,000, as compared with January, 1927.

MR. K. FRASER, managing director of the Yorkshire Copper Works, Ltd., and Sir D. Milne-Watson, governor of the Gas, Light and Coke Co., have been nominated for addition to the list of vice-presidents of the Federation of British Industries.

OVERHEATING OF A BOILER caused an outbreak of fire on Friday, March 25, at the premises of the Smith Chemical Co., Amies Street, Battersea. Firemen were quickly on the spot, and after half-an-hour's strenuous work the fire was brought under control.

THE OLIVER CONTINUOUS FILTER CO., owing to increased business has removed to larger offices. Since March 26, the address of the company has been: Premier House, 150, Southampton Row, London, W.C.1. Telegrams: Oliconfilt, Westcent, London. Telephone: Museum 3243.

A PAPER ON "Recent Developments in Alloy Steels," by Sir Robert Hadfield, Mr. W. B. Pickering and Mr. S. A. Main, was read at a meeting in Leeds on Friday, March 23, of the North Eastern centre of the Institution of Locomotive Engineers. A portion of the paper was devoted to heat and corrosion resisting steels.

AT THE RESUMED INQUEST on Flight-Lieut. Kinkead at Calshot, on Monday, it was stated that there was no evidence of the presence of carbon monoxide, and no lead or lead compound was found either in the lung tissues or blood, which was sent for an analysis. It will be recalled that it was stated that Flight-Lieut. Kinkead was using a fuel containing lead tetraethyl while on his last flight.

MEMBERS OF THE AMERICAN CERAMIC SOCIETY will visit England in June next. Two days will be spent in Stoke-on-Trent, the centre of the British pottery industry. On the evening of June 22, there will be a banquet in London, given by all the societies and associations connected with the ceramic and glass industries. After this the delegation will proceed to visit various glass and pottery works, China Clay mines, etc.

"THE STORY OF IRON" is the title of a new educational motion picture film just produced by the United States Bureau of Mines, Department of Commerce, in co-operation with three large iron companies. The film depicts in a popular manner the processes involved in the mining and metallurgy of iron, which is styled the most useful of all the metals, due to its great strength, its adaptability to working, its abundance, and low cost.

THE CUSTOMARY NOTICES to chemical manufacturers reminding them to renew certificates of registration have been enlarged to include several new processes, which are brought within the scope of the Alkali Works Act for the first time, chiefly concerning benzene, pyridine, bromine, and hydrofluoric acid. The authorities are endeavouring to reach all these new firms liable to registration, but a few may be overlooked. Owners of chemical works who may be in doubt regarding certain processes are asked to make use of the services of the inspectors in their district, who are qualified to give advice and to explain the requirements of the new order.

ARTIFICIAL SILK NEWS.—A meeting of the board of directors of Vereinigte Glanzstoff decided on Monday to propose a dividend of 18 per cent., compared with 15 per cent. last year, and an increase in the share capital by 15,000,000 marks to 75,000,000 marks.—The United States, with an output of 33,500 tons in the past year, was again the greatest producer of artificial silk, according to estimates published in Berlin. Germany advanced from third position to second, with an output of 18,000 tons, while Britain was placed third instead of fourth, with 17,700 tons. Italy, who was second in 1926, has now dropped to fourth, with 17,500 tons. The world's total output is estimated at some 120,000 tons, against 97,000 in 1926, and 11,000 in 1913.

Obituary

DR. P. CAMILLE CHABRIE, aged 67. Since 1907 he had been director of the Institute of Applied Chemistry in Paris.

MR. JOHN BURKE FARLIE, late chief metallurgist in the Royal Carriage Department, Woolwich Arsenal, recently, at Charlton. He was also first lecturer in chemistry and metallurgy at Woolwich Polytechnic.

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Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

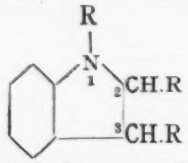
Abstracts of Complete Specifications

285,999. SIMULTANEOUS ABSORPTION OF AMMONIA AND HYDROGEN SULPHIDE FROM INDUSTRIAL GASES, PROCESS FOR. W. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, November 26, 1926.

Coal gas and coke-oven gas are treated for the simultaneous absorption of ammonia and hydrogen sulphide by means of an aqueous solution of a mixture of ammonium sulphite and bisulphite having the ratio $NH_3 : SO_2$ equal to 1·2 to 1·75 : 1. The ammonia converts the bisulphite into neutral ammonium sulphite and the hydrogen sulphide converts the ammonium sulphite and bisulphite into ammonium thiosulphate and polythionates with only slight separation of sulphur. The process can be carried out in two stages, in the first of which the ratio of ammonia to sulphurous acid is less than 1·5 : 1, while in the second stage the ratio is higher than 1·5 : 1. In the first stage the temperature of the liquid is 60°–70° C. and the gas is above the dew point of water, while the gas is cooled before treatment in the last stage. The proportion of ammonia to sulphurous acid must be maintained between the above limits during the process. The presence of carbon dioxide in the gases has no effect on the removal of ammonia and hydrogen sulphide.

286,005. INDOPHENOLS AND LEUCOINDOPHENOLS, AND DYESTUFFS THEREFROM, MANUFACTURE OF. W. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, November 27, 1926.

These indophenols are obtained by the oxidation of a 2 : 3-dihydrogenated indol having the general formula



(in which R represents hydrogen or alkyl- or aryl-residues) together with a *p*-aminophenol. The indophenols can also be obtained by condensation of the hydrogenated indols with a quinone chloroimide or with a *p*-nitrosophenol. These indophenols are soluble in alkalies giving deep red solutions which are intermediates in the manufacture of sulphur dyestuffs and vat dyestuffs. The corresponding leuco compounds are obtained by a reduction of indophenols. Examples are given of the oxidation of 1-methyl-2 : 3-dihydroindol and *p*-amino-phenol, 2 : 3-dihydroindol and *p*-amino-phenol, and others, and also an example of the condensation of a hydrogenated indol. To obtain the dyestuffs, the intermediate indophenols or leucoindophenols are subjected to the polysulphide melting process. Some examples are given.

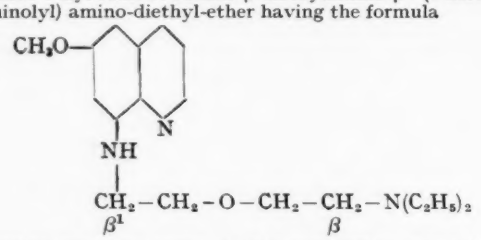
285,932 and 286,196. GUANIDINE DERIVATIVES, MANUFACTURE AND PRODUCTION OF. W. Carpmael, London. From Chemische Fabrik auf Actien (vorm E. Schering), 170 and 171, Mullerstrasse, Berlin. Application dates, October 15 and 16, 1926.

285,932. S-alkyl-isothiourea or a derivative is caused to act on a solid or liquid mono-amine or a derivative having a basic reaction, *i.e.*, free from acidic groups, and which is liquid or solid at ordinary temperature. This effects the splitting off of mercaptan and the production of the corresponding guanidine compound. These compounds are decomposed by alkaline substances and can be combined with phospho-tungstic acid. In an example, S-ethyl-isothiourea hydrobromide is treated with ethanol-amine and in another example with methyl-amino-ethanol. In the latter case sodium picrate precipitates the picrate of methyl-guanidine-ethanol. This is decomposed with hydrochloric acid, and the picric acid extracted with ether to obtain the hydrochloride, which is soluble in methyl, ethyl, or isopropyl alcohol. This compound has an asymmetric structure, and represents an hitherto unobtainable alcohol. A number of other examples are given. The compounds are used for therapeutic purposes.

286,196. This is an addition to 285,932 above. The same guanidine alcohols or their derivatives are obtained by treating amino alcohol salts or derivatives with cyanamide, and an example is given of the treatment of methyl-amino-ethanol hydrobromide with cyanamide to obtain methyl-guanidino-ethanol hydrobromide.

286,087. POLYAMINO COMPOUNDS, MANUFACTURE OF. W. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, November 19, 1926. Addition to 267,169.

Specification No. 267,169 describes the production of polyamino products of the quinoline, di- and tri-arylmethane, azine, oxazine, thiazine, acridine, and xanthene series, in which newly introduced nitrogen atoms are combined with aromatic amino groups through the medium of aliphatic radicles. In this invention, the side chain carrying the aliphatic nitrogen, and whether occurring once or more times, and whether straight or branched, is interrupted one or more times by ether-like bound oxygen or sulphur. In an example, 6-methoxy-8-aminoquinoline is treated with β-diethyl-amino-β^1-chloro-ethyl ether to obtain β-diethylamino-β^1-(6-methoxy-8-quinolyl) amino-diethyl-ether having the formula



Examples are also given of the production of β-diethyl-amino-β^1-(6-methoxy-8-quinolyl) amino-ethylene-glycol-diethyl-ether and β-diethylamino-β^1-(6-methyoxy-8-quinolyl) aminodiethyl-thioether. Particulars are given of the production of the β-diethylamino-β^1-chloro-ethyl-ether referred to in the first example above.

286,123. CATALYSTS. I.G. Farbenindustrie Akt.-Ges. Frankfurt-on-Main, Germany. Application date, May 6, 1927. Addition to 281,218.

Metal catalysts for reducing or hydrogenating organic compounds are obtained in finely divided form by precipitating them from solution in neutral, acid, or alkaline medium by means of a more electro-positive metal in the presence of an organic base or acid amide, and in the presence or absence of a non-metallic carrier. The more electro-positive metal may be zinc or aluminium, or alternatively hydrogen may be used, in which case a metal is preferably added also. Examples are given of the application to the preparation of nickel and cobalt.

286,152. MERCAPTANS OF THE FURFURYL SERIES, PROCESS OF PRODUCING. E. C. R. Marks, London. From Internationale Nahrungs- und Genussmittel Akt.-Ges., 22, Fronwagplatz, Schaffhausen, Switzerland. Application date, July 25, 1927.

Furfuryl-disulphide is obtained from the aldehyde by a treatment with sulphides or sulphydrates of the alkalies, earth alkalies, or ammonia, and the mercaptan may be obtained from the furfuryl-disulphide by reduction in an acid, neutral or alkaline solution. A number of examples are given.

286,172. POTASSIUM CARBONATE AND OTHER POTASSIUM SALTS, PROCESS FOR THE MANUFACTURE OF. J. H. Brégeat, 24, Rue de la Fidélité, Paris. Application date, September 22, 1927.

Potassium chloride is mixed with silica and the mixture heated to obtain the silicate. The silicate is dissolved in water and treated with carbon dioxide to obtain potassium

carbonate. The potassium carbonate may be treated with the equivalent quantity of calcium nitrate to obtain potassium nitrate, which is then separated out. The process may be used for the production of fertilisers.

NOTE.—Abstracts of the following specifications which are now accepted appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—261,787 (J. Trautmann), relating to catalytic processes, see Vol. XVI, p. 122 ; 264,827 (I.G. Farbenindustrie Akt.-Ges.), relating to unsaturated hydrocarbons, see Vol. XVI, p. 339 ; 264,867 (Stockholms Superfosfat Fabriks Aktiebolag), relating to treatment of phosphates, see Vol. XVI, p. 361 ; 265,167 (Schering Kahlbaum Akt.-Ges.), relating to derivatives of 2-aminopyridine, see Vol. XVI, p. 361 ; 265,960 (I.G. Farbenindustrie Akt.-Ges.), relating to primary aliphatic and cyclic amines, see Vol. XVI, p. 402 ; 267,958 (S. Stransky and F. Hansgirg), relating to cracking hydrocarbon oils under pressure, see Vol. XVI, p. 535 ; 271,440 (A. F. Meyerhofer), relating to soluble hydrates of alkali metals, see Vol. XVII, p. 87 ; 278,390 (I.G. Farbenindustrie Akt.-Ges.), relating to condensation products from urea, thiourea, etc., and an alcohol or ketone, see Vol. XVII, p. 515 ; 278,700 (Soc. du Gaz de Paris), relating to purification of gas, see Vol. XVII, p. 536 ; 278,723 (Siemens and Halske Akt.-Ges.), relating to metallic beryllium, see Vol. XVIII, p. 7 (Metallurgical Section) ; 279,870 (Metallbank und Metallurgische Ges. Akt.-Ges.), relating to alumina, see Vol. XVIII, p. 35 ; 280,530 (I.G. Farbenindustrie Akt.-Ges.), relating to purification of magnesium and alloys, see Vol. XVIII, p. 15 (Metallurgical Section) ; 281,650 (Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler), relating to 2-chloropyridine, see Vol. XVIII, p. 104 ; 282,023 (Rhenania Kunheim Verein Chemische Fabriken Akt.-Ges.), relating to dissociation of zirconium ores, see Vol. XVIII, p. 150.

International Specifications not yet Accepted

284,199. PERFUMES. F. Boedecker, 98, Schweinfurthstrasse, Dahlem, Berlin. International Convention date, January 24, 1927. Addition to 285,156.

Specification No. 285,156 (see THE CHEMICAL AGE, Vol. XVIII, p. 247) describes the treatment of safrol or camphor oil with alcoholic alkalies to obtain *m*- and *p*-propenyl-pyrocatechin-monomethoxyethers, and in this invention the product is ethylated instead of methylated. The propenyl-catechin-ether containing the alkyl radicle in the para position to the propenyl group is less soluble than the corresponding meta compounds and the alkali salts and the acidyl compounds of the propenyl-pyrocatchin-ether ethylated in the meta position are less soluble than the para compounds, while the *m*-ethyl-protocatechuic aldehyde is more soluble in alkali carbonates than the para compound. These facts enable separation to be effected. Examples are given.

284,206. SULPHONATED OILS. H. Flesch, 135, Kettenhofweg, Frankfurt-on-Main, Germany. Assignee of Farb- und Gerbstoffwerke C. Flesch, Frankfurt-on-Main, Germany). International Convention date, January 24, 1927. Addition to 282,626.

Oils or fats or their fatty acids are sulphonated by sulphur trioxide or chlorsulphonic acid in the presence of anhydrous formic, propionic, butyric, or lactic acid, or their anhydrides, or acid chlorides.

204,208. SULPHURIC ACID. Soc. Generale Metallurgique de Hoboken, Hoboken-les-Anvers, Belgium. International Convention date, January 24, 1927.

Sulphuric acid is made from cold sulphurous gases and the acid is denitrated in a tower filled with inert material by means of hot sulphurous gases obtained by heating the cold gas or by roasting pyrites.

284,224. HYDROCARBONS. F. J. M. Hansen, 63, Alte Landstrasse, Küsnacht, near Zurich, Switzerland. International Convention date, January 24, 1927.

Carbon or hydrocarbons are treated with atomic hydrogen obtained by dissociating hydrogen by an electric arc or hot spark discharge. An example is given of the treatment of naphthalene vapour.

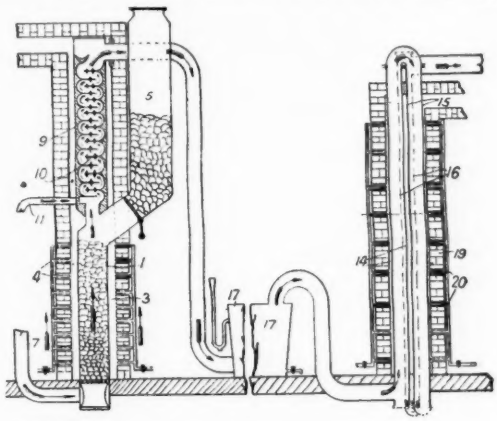
284,242 and 284,247. DYES AND INTERMEDIATES. I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, January 25, 1927.

284,242. These dyes are obtained by the reaction of hydroxy-anthraquinones and ethylene diamine. Several examples are given of the manufacture of these products, some of which are dyestuffs for cellulose acetate silk.

284,247. Azo dyes are obtained by coupling an arylide of 2:3-oxy-naphthoic acid with a diazotised *as-m*-xylidine substituted by a second amino group in *m*-position to the first, with one of both hydrogen atoms of the second amino group replaced by alkyl, aralkyl, benzoyl, substituted benzoyl, or aryl-sulphonic acid groups. In an example, cotton is impregnated with a solution of the α- or β-naphthalide of 2:3-oxy-naphthoic acid and developed with a diazo solution of benzoyl-amino-*as* - *m* - xylidine (NH_2:CH_3:CH_3:NH-CO-C_6H_5 = 1:2:4:5) to obtain a bluish red dyestuff.

284,262. HYDROGEN. J. Bellay, 89, Rue d'Auderghem, Brussels. International Convention date, January 26, 1927.

The apparatus is for producing pure hydrogen from water gas. Coke, lignite, charcoal or the like is fed from a hopper 5



284,262

to a producer 1, and steam is fed from a pipe 7. The producer is heated by a flue 3 surrounded by burners 4. Steam is admitted at 11, and passes upwards with the water gas through a column 9 having charcoal and fireclay baffles 10, whereby the gas is enriched with hydrogen. The gas then passes through a purifier 17 containing soda-lime milk, and then through a final purifier consisting of tubes 14, 15, 16, within a casing 19 heated by burners 20. The purifying substance consists of bodies obtained by slaking quicklime or soda-lime at 95° C. with a solution of soda, screening the product, moulding it, and sprinkling with lime milk or soda-lime milk at 50° C. to agglomerate it.

284,272. METHYLOL UREAS. G. Walter, 18, Meyengasse, Vienna. International Convention date, November 28, 1925.

Urea, thiourea and their derivatives are treated with formaldehyde or a polymer in an organic solvent, preferably in the presence of a base. Thus, a solution of paraformaldehyde in alcohol containing sodium hydroxide is treated with urea to obtain dimethylol urea, which is filtered off.

284,280. SULPHONATING OILS, ETC. H. T. Böhme Akt.-Ges., 29, Moritz-strasse, Chemnitz, Germany. International Convention date, January 27, 1927.

Oils, fatty acids, or their glycerides are treated with an excess of sulphuric acid below 0° C., and thickening is prevented by adding hydrocarbons or halogen hydrocarbons which are not affected by the sulphuric acid. Thus, a mixture of recinoleic acid and benzol is treated with sulphuric acid at −10° C., and the product washed and neutralised.

284,288. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, January 27, 1927.

Aryl-thioglycollic acids are condensed with *o*-diketones such as acenaphthene-quinone, or isatin and its homologues or substitution products or α-derivatives in the presence of phosphorus pentoxide and a solvent or dispersing agent. Thio-indigoid dyes are obtained. Examples are given of the condensation of 1-chlornaphthalene-2-thioglycollic acid and isatin, naphthalene-2-thioglycollic acid and 5 : 7-dibromisatin, 6-methyl-4-chlorphenyl-thioglycolic acid and acenaphthene-

quinone. In all cases, the condensation is effected in the presence of chlorbenzene or dichlorbenzene and phosphorus pentoxide mixed with silica.

LATEST NOTIFICATIONS.

287,076. Production of sulphuric esters of poly-oxy fatty acids. Flesch, H. March 14, 1927.

287,133. Process for the production of potassium nitrate. Kali-Industrie Akt.-Ges., Thorssell, T., and Kristensson, A. March 16, 1927.

287,135. Manufacture of acetic acid from acetylene. Karpati, Dr. J., and Hubsch, Dr. M. G. March 16, 1927.

287,110. Manufacture of 1- methyl-2 : 5- dichloro 4-amino-benzene. I.G. Farbenindustrie Akt.-Ges. March 15, 1927.

287,450. Process of improving the resistance to corrosion of magnesium and magnesium alloys. I.G. Farbenindustrie Akt.-Ges. March 19, 1927.

287,137. Nitro-cellulose lacquers or varnishes. I.G. Farbenindustrie Akt.-Ges. March 16, 1927.

287,093. Manufacture of organic arsenic preparations and the application thereof as seed grain immunising media. I.G. Farbenindustrie Akt.-Ges. March 14, 1927.

287,095. Manufacture of condensation products from urea, thiourea, or their derivatives, and an alcohol or a ketone. I.G. Farbenindustrie Akt.-Ges. March 14, 1927.

287,114. Preparation of benzene soaps. I.G. Farbenindustrie Akt.-Ges. November 9, 1925.

287,115. Preparation of oil varnishes containing resins. I.G. Farbenindustrie Akt.-Ges. November 9, 1925.

287,116. Preparation of cellulose ester lacquers. I.G. Farbenindustrie Akt.-Ges. November 9, 1925.

287,178. Manufacture of substituted thioglycollic acids. I.G. Farbenindustrie Akt.-Ges. March 18, 1927.

287,179. Process for the manufacture of condensation product of the benzodiazine series. I.G. Farbenindustrie Akt.-Ges. March 18, 1927.

287,464. Process for the manufacture of suspensions and emulsions. I.G. Farbenindustrie Akt.-Ges. March 18, 1927.

287,465. Process for the manufacture of growth-promoting substances for animal cells. I.G. Farbenindustrie Akt.-Ges. March 18, 1927.

Specifications Accepted with Date of Application

258,289. Condensation products of urea and formaldehyde, Manufacture and production of. I.G. Farbenindustrie Akt.-Ges. September 11, 1925.

261,400. Condensation products of the anthracene series, Manufacture of. I.G. Farbenindustrie Akt.-Ges. November 13, 1925.

271,454. Copper-beryllium alloys and their treatment. Siemens and Halske Akt.-Ges. May 21, 1926.

272,538. Destructive hydrogenation of carbonaceous materials. I.G. Farbenindustrie Akt.-Ges. June 11, 1926.

275,646. Furnaces for treating iron with a low proportion of carbon. F. Wust. August 6, 1926.

277,651. Ozone, Production of. Siemens and Halske Akt.-Ges. September 14, 1926.

277,652. Drying, neutralising, and delivering ammonium salts and other granular substances, Method of, and apparatus for. International Cement Gun Co. Ges. September 14, 1926.

286,749 and 287,001. Accelerators for the vulcanisation of rubber. E. C. R. Marks. (*Rubber Service Laboratories Co.*) October 6, 1926.

286,795. Tin from ores and the like, Extraction of. H. L. Sulman and H. F. K. Picard. December 13, 1926.

286,796. Aralkylated unsaturated fats and fatty acids and their sulphonic acids, Manufacture of. K. Carpmael and K. S. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) December 13, 1926.

286,797. Halogenated alcohols, Manufacture of. I.G. Farbenindustrie Akt.-Ges., and J. Callsen. December 13, 1926. Addition to 235,584.

286,808. Lignin sulphonic acid (sulphite cellulose waste), Manufacture of new derivatives from. British Dyestuffs Corporation, Ltd., and A. J. Hailwood. December 21, 1926.

286,825. Hydrocarbons from coal, tars, mineral oils, and the like, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) January 3, 1927.

286,845. Carbon, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) February 4, 1927.

286,850. Ethylene glycol, Manufacture of. British Dyestuffs Corporation, Ltd., K. H. Saunders and H. Wignall. February 8, 1927.

286,865 and 286,980. Sulphuric acid, Manufacture of. A. Sharp. (*Soc. Generale Metallurgique de Hoboken.*) February 19, 1927, and August 23, 1927.

286,917. Heavy hydrocarbons, Treatment of—for the production of lighter hydrocarbons, and apparatus therefor. C. Arnold. (*Standard Development Co.*) May 2, 1927.

286,984. Quaternary ammonium compounds from halogen substituted tertiary aromatic amines, Manufacture of. K. Carpmael and K. S. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) December 10, 1926.

287,020. Dyestuffs of the anthraquinone series, Manufacture of. L. Cassella and Co. Ges. November 3, 1926. Addition to 260,998.

Applications for Patents

Arnold, C., and Standard Oil Development Co. March 24. Treatment of emulsions of hydrocarbons, etc. 8,989. March 24.

Bridger, C. J., Imperial Chemical Industries, Ltd., and Smith, H. G. Production of ethyl alcohol. 8,252. March 19.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of finely-divided iron oxide. 8,627. March 21.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of alkoxyacridinium compounds. 8,780. March 22.

Compagnie Nationale de Matieres Colorantes et Manufactures de Produits Chimiques du Nord Réunies Etablissements Kuhlmann. Manufacture of diazo compounds, etc. 8,863. March 23. (France, April 12, 1927.)

Curtin, L. P. Process of making alkali hydroxides. 8,478. March 20.

Davidson, T. M. Distillation of carbonaceous substances. 8,493. March 20.

Davis, W. G., and Imperial Chemical Industries, Ltd. Manufacture of higher alcohols. 8,544. March 21.

Dreyfus, H. Manufacture of aliphatic compounds. 8,574. March 21.

Dreyfus, H. Manufacture of aliphatic compounds. 8,969, 8,970, 8,971, 8,972. March 24.

Gordon, K., and Imperial Chemical Industries, Ltd. Concentration of aqueous solutions of caustic alkalies. 8,251. March 19.

Horsley, G. F., and Imperial Chemical Industries, Ltd. Production of aluminium sulphate. 8,258. March 19.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of high-valent etherified alcohols, etc. 8,287. March 19.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Producing non-corrosive, etc., surfaces on iron. 8,288. March 19.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Production of nitrogenous vat dyestuffs. 8,289. March 19.

I.G. Farbenindustrie Akt.Ges. and Johnson, J. Y. Recovery of acid alkali metal phosphates from crude phosphates. 8,290. March 19.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Conversion of sulphates. 8,291. March 19.

I.G. Farbenindustrie Akt.Ges. and Johnson, J. Y. Production of complex metallic compounds of azo dyestuffs. 8,292. March 19.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Colouration of wall plasters, etc. 8,293. March 19.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of complex metallic compounds of *o*-hydroxyazo dyestuffs. 8,600. March 21.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of aromatic carboxylic acids. 8,601. March 21.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production and application of plates for condensers, etc. 8,725. March 22.

I.G. Farbendindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of pure hydrated chromic chloride. 8,834. March 23.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of hydrogen cyanide. 8,835. March 23.

Imperial Chemical Industries, Ltd., and Ward, W. J. V. Recovery of methanol. 8,543. March 21.

Imperial Chemical Industries, Ltd., and Ward, W. J. V. Effecting gaseous dehydrating reactions. 8,545. March 21.

Kilsdonk, A. T. Manufacture of halogenated benzanthrones. 8,262. March 19.

Schering-Kahlbaum Akt.-Ges. Manufacture of 5-iodo-2-amino pyridine. 8,628. March 21. (Germany, April 12, 1927.)

Selden Co. Purification of crude anthracene. 8,338. March 19. (United States, January 16.)

Selden Co. Catalytic reduction of organic nitrogen compounds. 8,370. March 19. (United States, January 23.)

Soc. Chimique des Usines du Rhone. Manufacture of potassium manganate. 8,345. March 19. (France, June 29, 1927.)

Soc. Chimique des Usines du Rhone. Manufacture of potassium manganate. 8,492. March 20. (France, August 26, 1927.)

Soc. voor Chemische Industrie Katwijk. Process for extracting theobromine from natural products. 8,546. March 21. (Holland, March 22, 1927.)

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of condensation products of benzanthrone series. 8,958. March 24.

I.G. Farbenindustrie Akt.-Ges. Manufacture of emulsions, etc. 8,317. March 19. (Germany, March 18, 1927.)

I.G. Farbenindustrie Akt.-Ges. Process of purifying cellulose xanthate. 8,612. March 21. (Germany, March 21, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of condensation products from urea, etc. 8,746. March 22. (Germany, May 9, 1927.)

I.G. Farbenindustrie Akt.-Ges. Working up cellulose ethers. 8,779. March 22. (Germany, March 31, 1927.)

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity strength, and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages extra.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 11d. to 2s. 4d. per gall.; pyridinised industrial, 2s. 1d. to 2s. 6d. per gall.; mineralised, 3s. to 3s. 4d. per gall.; 64 O.P., 1d. extra in all cases; prices according to quantity as from March 1, 1928.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3⅞d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6½d. to 7¾d. per lb. Crude 60's, 2s. 3d. to 2s. 4d. per gall. prompt.

ACID CRESYLIC 99/100.—3s. per gall. 97/99.—2s. 6d. to 2s. 7d. per gall. Pale, 95%, 2s. 5d. to 2s. 6d. per gall. Dark, 95%, 2s. 2d. to 2s. 3d.

ANTHRACENE.—A quality, 2½d. per unit. 40%, £5 per ton.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7¾d. to 8d. per gall.

BENZOLE.—Prices at works; Crude, 8½d. to 9d. per gall.; Standard Motor, 1s. 1d. to 1s. 2d. per gall.; 90%, 1s. 2d. to 1s. 3d. per gall.; Pure, 1s. 5d. to 1s. 6d. per gall.

TOLUOLE.—90%, 1s. 4d. to 1s. 8d. per gall. Firm. Pure, 1s. 6d. to 1s. 10d. per gall.

XYLOL.—1s. 3d. to 1s. 7d. per gall. Pure, 2s. 4d. per gall.

CREOSOTE.—Cresylic, 20/24%, 10d. to 11d. per gall.; middle oil, 7⅞d. to 8⅞d. per gall. Heavy, 8½d. to 8⅝d. per gall. Standard specification, 7⅜d. to 7⅝d. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 7½d. to 8d. per gall. Solvent 90/160, 10d. to 10½d. per gall. Solvent 95/160, 1s. 3d. to 1s. 4d. per gall. Solvent 90/190, 9½d. to 1s. 2d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £5 per ton. Whizzed or hot pressed, £8 per ton.

NAPHTHALENE.—Crystals, £13 to £14 10s. per ton. Quiet. Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 60s. to 70s. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 5s. 6d. to 7s. per gall. 90/180, 3s. to 5s. per gall. Heavy, 2s. 6d. to 3s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 8½d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 3d. to 2s. 5d. per lb.

p-CRESOL 32/34° C.—2s. 3d. to 2s. 5d. per lb.

DICHLORANILINE.—2s. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—8½d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—2s. 1d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £10 5s. per ton. Good demand. Grey, £14 10s. to £15 per ton. Liquor, 9d. per gall.

CHARCOAL.—£6 to £9 per ton, according to grade and locality. Foreign competition severe.

IRON LIQUOR.—1s. 3d. per gall, 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10d. per gall.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 11d. to 4s. 3d. per gall. Solvent, 4s. 3d. per gall.

WOOD TAR.—£4 to £5 per ton.

BROWN SUGAR OF LEAD.—£40 15s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 5½d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 6d. to 2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 1d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPHONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. to 6s. 3d. per lb.

ZINC SULPHIDE.—1s. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 5d. to 2s. 7d. per lb.

ACID, BENZOIC, B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz., according to quantity.

ACID, BORIC B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—2s. to 2s. 2d. per lb. Less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.
ACID, SALICYLIC, B.P. PULV.—1s. 2½d. to 1s. 4d. per lb. Technical.—11½d. to 11⅞d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 4½d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—8s. to 8s. 3d. per lb.
AMMONIUM BENZOATE.—3s. to 3s. 3d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
ATROPINE SULPHATE.—9s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. 3d. per lb. spot.
BISMUTH CARBONATE.—11s. 4d. to 11s. 7d. per lb.
BISMUTH CITRATE.—10s. 4d. to 10s. 7d. per lb.
BISMUTH SALICYLATE.—10s. 7d. to 10s. 10d. per lb.
BISMUTH SUBNITRATE.—9s. 7d. to 9s. 10d. per lb.
BISMUTH NITRATE.—6s. 7d. to 6s. 10d. per lb.
BISMUTH OXIDE.—14s. 7d. to 14s. 10d. per lb.
BISMUTH SUBCHLORIDE.—14s. 4d. to 14s. 7d. per lb.
BISMUTH SUBGALLATE.—8s. 7d. to 8s. 10d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 1½d. per lb.; 12 W. Qts. 1s. 0½d. per lb.; 36 W. Qts., 1s. per lb.
BORAX B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Ammonium, 2s. to 2s. 1d. per lb.; potassium, 1s. 8¾d. to 1s. 9¾d. per lb.; sodium, 1s. 11d. to 2s. per lb.; granulated, ½d. per lb. less; all spot. Large quantities at lower rates.
CALCIUM LACTATE.—1s. 2½d. to 1s. 3½d. per lb.
CAMPHOR.—Refined flowers, 2s. 11d. to 3s. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 2d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—1s. 0½d. to 1s. 1½d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE.—£39 per ton, in barrels ex wharf.
GUAIACOL CARBONATE.—4s. 9d. to 5s. per lb.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28 lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
IRON AMMONIUM CITRATE.—B.P., 2s. 5d. to 2s. 8d. per lb. Green, 2s. 8d. to 3s. 1d. per lb.; U.S.P., 2s. 6d. to 2s. 9d. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8¾d. to 9¼d. per oz.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.
MENTHOL.—A.B.R. recrystallised B.P., 17s. per lb. net for January delivery; Synthetic, 9s. to 10s. per lb.; Synthetic detached crystals, 9s. to 12s. 6d. per lb., according to quantity; Liquid (95%), 9s. 6d. per lb.
MERCURIALS B.P.—Up to 1 cwt lots, Red Oxide, 7s. 6d. to 7s. 7d. per lb., levig., 7s. to 7s. 1d. per lb.; Corrosive Sublimate, Lump, 5s. 9d. to 5s. 10d. per lb., Powder, 5s. 2d. to 5s. 3d. per lb.; White Precipitate, Lump, 5s. 11d. to 6s. per lb., Powder, 6s. to 6s. 1d. per lb., Extra Fine, 6s. 1d. to 6s. 2d. per lb.; Calomel, 6s. 4d. to 6s. 5d. per lb.; Yellow Oxide, 6s. 10d. to 6s. 11d. per lb.; Persulph., B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 5s. 10s. to 5s. 11d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 5d. to 1s. 9d. per lb.
METHYL SULPHONAL.—9s. to 9s. 3d. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 1d. to 1s. 4d. per lb.
PHENACETIN.—2s. 6d. to 2s. 9d. per lb.
PHENAZONE.—4s. to 4s. 3d. per lb.
PHENOLPHTHALEIN.—6s to 6s. 3d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—102s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 5d. to 2s. 6d. per lb.; U.S.P., 2s. 3d. to 2s. 6d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—55s. per lb.; in quantity lower.
SALOL.—2s. 4d. per lb.
SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.
SODIUM CITRATE, B.P.C., 1911.—2s. to 2s. 3d. per lb., B.P.C., 1923—2s. 4d. to 2s. 5d. per lb. U.S.P., 2s. 3d. to 2s. 6d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—90s. to 95s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 7d. to 1s. 9d. per lb. Crystal, 1s. 8d. to 1s. 10d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—6s. 9d. to 7s. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
THYMOL.—Puriss., 9s. 6d. to 9s. 9d. per lb., according to quantity. Firmer. Natural, 14s. 3d. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—11s. per lb.
AMYL ACETATE.—2s. per lb.
AMYL BUTYRATE.—4s. 9d. per lb.
AMYL SALICYLATE.—2s. 9d. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL BENZOATE.—2s. 9d. per lb.
CINNAMIC ALDEHYDE NATURAL.—15s. 6d. per lb.
COUMARIN.—9s. 9d. per lb.
CITRONELLOL.—13s. 6d. per lb.
CITRAL.—8s. 3d. per lb.
ETHYL CINNAMATE.—6s. per lb.
ETHYL PHTHALATE.—3s. per lb.
EUGENOL.—8s. 3d. per lb.
GERANIOL (PALMAROSA).—20s. per lb.
GERANIOL.—6s. to 10s. per lb.
HELIOTROPINE.—4s. 6d. per lb.
ISO EUGENOL.—13s. per lb.
LINALOL.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 10s. 6d. per lb.
LINALYL ACETATE.—Ex Shui Oil, 14s. per lb.
METHYL ANTHRANILATE.—8s. 6d. per lb.
METHYL BENZOATE.—4s. per lb.
MUSK KETONE.—35s. per lb.
MUSK XYLOL.—7s. per lb.
NEROLIN.—4s. 6d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—10s. 6d. per lb.
RHODINOL.—35s. per lb.
SAFROL.—1s. 6d. per lb.
TERPINEOL.—1s. 8d. per lb.
VANILLIN.—15s. 3d. to 16s. 6d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. 6d. per lb.
ANISE OIL.—2s. 9d. per lb.
BERGAMOT OIL.—22s. 6d. per lb.
BOURBON GERANIUM OIL.—15s. per lb.
CAMPHOR OIL.—9d. per lb.
CANANGA OIL, JAVA.—12s. 9d. per lb.
CINNAMON OIL LEAF.—6s. 9d. per lb.
CASSIA OIL, 80/85%.—8s. 3d. per lb.
CITRONELLA OIL.—Java, 1s. 10d. per lb., c.i.f. U.K. port. Ceylon, pure, 1s. 9d. per lb.
CLOVE OIL.—5s. 6d. per lb.
EUCALYPTUS OIL, AUSTRALIAN.—2s. 1d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, Esters, 15s. 6d. per lb.
LEMON OIL.—9s. 6d. per lb.
LEMONGRASS OIL.—4s. 3d. per lb.
ORANGE OIL, SWEET.—13s. per lb.
OTTO OF ROSE OIL.—Anatolian, 35s. per oz. Bulgarian, 62s. 6d. per oz.
PALMA ROSA OIL.—12s. 6d. per lb.
PEPPERMINT OIL.—Wayne County, 15s. 9d. per lb.; Japanese, 7s. 3d. per lb.
PETITGRAIN.—7s. 3d. per lb. Sandalwood, Mysore, 26s. 6d. per lb., 90/95%, 16s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, March 29, 1928.

THERE has been a fairly satisfactory volume of business passing during the past week, with prices on the whole firm and without change. Export trade is improving and a greater volume of inquiry is coming to hand.

General Chemicals

ACETONE maintains its higher quotations at £65 to £67, and is in fair demand.

ACID ACETIC holds steady at £37 to £38 per ton for 80% technical quality, and is meeting with a good demand.

ACID CITRIC remains firm at about 2s. per lb., less 5%, with offers for forward delivery scarce. Inquiry is increasing.

ACID FORMIC is unchanged at about £47 per ton for 85% technical and demand has been better

ACID LACTIC is a bright market with price firm at £43 for 50% by weight, pale qualities.

ACID OXALIC is in better request and price continues steady at £30 10s.

ACID TARTARIC has been in quite brisk demand with price ruling firm at 1s. 4½d. to 1s. 5d.

AMMONIUM CHLORIDE.—Slightly easier with demand rather dull.

ALUMINA SULPHATE continues firm with an average inquiry. Price about £5 15s. to £6 for best 17/18% grades.

ARSENIC.—Still only little interest shown with price steady at about £19 at London.

BARIUM CHLORIDE.—Inactive at about £8 5s.

COPPER SULPHATE is very firm at about £26 to £26 10s., with brisk demand, especially for shipment, and supplies for near delivery difficult to locate.

CREAM OF TARTAR.—The market continues firm with only small supplies offering and forward prices are also firm with producers well sold ahead. Spot price about £100 for B.P. 99/100% grade less usual discount.

EPSOM SALTS.—Unchanged at about £5, with satisfactory demand.

FORMALDEHYDE continues in fair request at about £39 in usual barrels.

LEAD ACETATE.—Quite a good demand is being received, and price holds firm at £42 for white, and brown £1 per ton less.

LEAD NITRATE.—Unchanged at £37 with good request.

LIME ACETATE.—Grey still in rather short supply with market holding firm.

METHYL ACETONE.—Demand continues active at £55 for standard 40/45% material.

POTASSIUM CARBONATE AND CAUSTIC show fair demand at unchanged prices.

POTASSIUM CHLORATE is in satisfactory request at about £30. Export demand is reviving which will tend to stiffen prices.

POTASSIUM PERMANGANATE.—Good needle crystal B.P. quality in steady demand at about 5¼d. with commercial quality about 5d. per lb.

POTASSIUM PRUSSIATE has been in better request for home account and price continues firm at £59 to £63 per ton according to quantity.

SODIUM ACETATE.—Price is again higher at £22, with supplies extremely sparse. Demand is brisk and supplies are expected to be on short side for some time.

SODIUM BICHROMATE is in good demand at British makers' prices with supplies of imported rather scarce.

SODIUM CHLORATE.—A fair demand is reported with price holding firm at about £28 to £30 according to quantity.

SODIUM HYPOSULPHITE.—A better demand is on the market with price unchanged at British makers' prices.

SODIUM NITRITE.—Inquiry continues active and price rules firm at £20.

SODIUM PHOSPHATE is in good request at £12 10s.

SODIUM PRUSSIATE.—Demand is satisfactory with price firm at 4½d., and in rather short supply for early delivery.

SODIUM SULPHIDE.—Unchanged in price with demand fair.

TARTAR EMETIC is very firm at 11¼d. to 11¾d. with demand brisk, especially for export.

ZINC SULPHATE continues active at unchanged rate of £12 10s.

Coal Tar Products

There is a certain amount of activity in the coal tar product market, although business is not very brisk, owing to supplies being scarce.

90's BENZOL is unchanged at about 1s. 3d. to 1s. 4d. per gallon, while the motor quality is quoted at 1s. 1d. to 1s. 2d. per gallon.

PURE BENZOLE is worth about 1s. 5½d. to 1s. 6½d. per gallon, on rails.

CREOSOTE OIL remains quiet, at about 7¼d. per gallon on rails, in the North, and 8d. per gallon, in London, although spot parcels can be bought at slightly under these figures. The forward position still remains fairly firm.

CRESYLIC ACID remains weaker, the 98/100% pale quality being quoted at 2s. 7d. per gallon at works, naked, and the dark quality 95/97% at 2s. per gallon.

SOLVENT NAPHTHA is very weak, and can be bought at about 8d. per gallon, on rails, in the provinces.

HEAVY NAPHTHA is in slightly better demand, and is quoted at 8¾d. to 9d. per gallon, naked, at makers' works.

NAPHTHALENES are unchanged, the 74/76 quality being quoted at about £7 per ton, while the 76/78 quality is quoted at £8 to £8 10s. per ton.

PITCH is steady at 60s. to 65s. per ton, f.o.b. U.K. port.

Latest Oil Prices

LONDON, March 28.—LINSEED OIL firm and 2s. 6d. to 5s. per ton higher. Spot, ex mill, £29 10s.; March-April, £28 15s.; May-August, £29 15s.; September-December, £30 17s. 6d. RAPE OIL slow and 10s. per ton lower. Crude extracted, £41; technical refined, £43; naked, ex wharf. COTTON OIL quiet. Refined common edible, £40; Egyptian crude, £35; deodorised, £42 per ton. TURPENTINE, inactive. American, spot, 40s. 9d.; April, 41s.; May-June, 41s. 3d.; July-December, 41s. 6d. per cwt.

HULL, March 28.—LINSEED OIL, spot and March, £29; April, £29 7s. 6d.; May-August, £29 17s. 6d.; September-December, £30 17s. 6d. COTTON OIL.—Bombay crude, £32 10s.; Egyptian crude (new), £33 15s.; edible refined, £37 15s.; technical, £36; deodorised, £39 15s. PALM KERNEL OIL.—Crushed naked, 5½ per cent., £38. GROUND NUT OIL.—Crushed-extracted, £42; deodorised, £46. SOYA OIL.—Extracted and crushed, £33; deodorised, £36 10s. RAPE OIL.—Crude-extracted, £40: refined, £42 per ton. COD OIL.—Spot, 30s. 6d. per cwt., net cash terms, ex mill.

Nitrogen Products

Export.—The demand for sulphate of ammonia continues satisfactory in consuming countries, and producers have no difficulty in disposing of available supplies at £10 to £10 2s. 6d. per ton, f.o.b. U.K. port in single bags. It is reported that consumption is quite satisfactory in the United States and that parcels have found their way into the Southern States from continental ports.

Home.—The home demand continues unabated. It is now reported that a very large demand has set in from Scotland. Prices remain unchanged, and small lots, which are being offered in various parts of the country at lower prices, seem all to be disposed of.

Nitrate of Soda.—There is no change in the nitrate position. Consumption is being met by diminution of stocks in consuming countries and the demand from Chile continues small. Prices remain unchanged at 16s. 6d. to 16s. 9d. per metric quintal.

South Wales By-Products

There is no material change to report in South Wales by-product activities. Business generally is on quiet lines, and both buyers and sellers appear to be holding off the pitch market. Pitch values have increased slightly, and the product changes hands round about 62s. 6d. to 67s. 6d. per ton. Creosote is unchanged at from 7¾d. to 8d. per gallon f.o.r. maker's works, while heavy and solvent naphthas continue to sell round about the 8d. to 9d. per gallon f.o.r. mark. Crude tar is easier at about 50s. per ton f.o.r., but refined tars are unchanged, coke oven tar selling at 7¾d. to 8¼d. per gallon, delivered in barrels, and gasworks tar at 7½d. to 8d. per gallon, delivered in barrels. Patent fuel and coke prices are unchanged, patent fuel (Cardiff) selling at from 21s. to 23s. per ton ex-ship, and Swansea at 21s. to 21s. 6d. ex-ship; coke (best foundry) 32s. 6d. to 37s. per ton, and other sorts from 25s. to 32s. 6d. per ton. Patent fuel exports for the four weeks ending March 20 totalled 82,496 tons, while oil imports over the same period amounted to 15,225,930 gallons.

Chemical Manufacturer Awarded Damages

AT BLACKBURN COUNTY COURT, on Monday, Edward Whalley, electrical engineer, of Blackburn Road, Great Harwood, was ordered to pay £44 3s. 6d. to Wm. Melling, chemical manufacturer, of Blackpool, for damage to a motor-car through alleged negligence. A counter-claim for £21 12s. 4d. was dismissed.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, March 28, 1928.

DURING the past week business in the heavy chemical market has been moderate, with export inquiry showing more activity than that for home business. Prices are practically unchanged.

Industrial Chemicals

ACETONE, B.G.S.—£63 to £66 per ton, ex store, according to quantity.

ACID ACETIC.—98/100%, glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80%, pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton; powdered, £32 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—Quoted 6¼d. per lb., f.o.b. U.K. ports.

ACID CITRIC, B.P.—Quoted 1s. 11¾d. per lb., less 5 per cent., ex store, spot delivery. Rather cheaper to come forward.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC.—80° quality, £24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer from the Continent at 3¼d. per lb., ex wharf. Spot material quoted 3½d. per lb., ex store. In better demand.

ACID SULPHURIC.—£2 15s. per ton, ex works, for 144° quality; £5 15s. per ton for 168° quality. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Now quoted 1s. 4½d. per lb., less 5 per cent., ex wharf. Demand rather easier.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Quoted £5 10s. per ton, c.i.f. U.K. ports, prompt shipment. Spot material available at about £5 15s. per ton, ex store.

ALUM LUMP POTASH.—Spot material available at about £9 per ton, ex store. Crystal meal quoted £8 10s. per ton, ex store. Lump quality on offer from the Continent at £8 5s. per ton, c.i.f. U.K. ports.

AMMONIA, ANHYDROUS.—Unchanged at about 9d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2¼d. to 3d. per lb. delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers crystals of British manufacture unchanged at £23 to £24 por ton, ex station. Continental on offer £19 15s. per ton, c.i.f. U.K. ports; fine white crystals quoted £17 10s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Quoted £19 7s. 6d. per ton, ex wharf, prompt despatch from mines. Spot material available at £20 5s. per ton, ex store.

BARIUM CARBONATE, 98/100%.—English material on offer at £7 5s. per ton, ex store. Continental quoted £7 per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Large white crystals quoted £6 17s. 6d. per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—British manufacturers' contract price to consumers, £6 12s. 6d. per ton, delivered, minimum four-ton lots. Continental on offer at £6 10s. per ton, ex wharf.

CALCIUM CHLORIDE.—British manufacturers' price £4 15s. per ton to £5 5s. per ton, ex station, according to quantity and point of delivery. Continental material quoted £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports for export.

COPPER SULPHATE.—Continental price unchanged at about £25 per ton, c.i.f. U.K. ports. Some British material available at about £25 per ton, ex store.

FORMALDEHYDE, 40%.—Offered at £35 10s. per ton, c.i.f. U.K. ports. Spot material quoted £39 per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material on offer at £31 per ton, ex store.

LEAD, WHITE.—Quoted £31 10s. per ton, ex store.

LEAD, ACETATE.—White crystals quoted £39 15s. per ton, c.i.f. U.K. ports. Brown, £38 10s. per ton, c.i.f. U.K. port. Spot material on offer at £42 15s. per ton, ex store, spot delivery.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. Now quoted 2s. per gallon, delivered.

POTASSIUM BICHROMATE.—4¼d. per lb. delivered, minimum four-ton lots. Under four-ton lots, ½d. per lb. extra.

POTASSIUM CARBONATE, 96/98%.—Rather scarce for immediate delivery. Quoted £25 10s. per ton, ex wharf. Spot material about £26 10s. per ton, ex store.

POTASSIUM CHLORATE, 99/100%.—Powdered material offered from the Continent at £25 10s. per ton, c.i.f. U.K. ports. Crystals, 30s. per ton more.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Unchanged at about 6½d. per lb., ex store, spot delivery. Offered from the Continent at 6⅜d. per lb.

SODA CAUSTIC.—Powdered, 98/99%, £17 17s. 6d. per ton; solid, 76/77%, £14 10s. per ton; 70/72%, £13 12s. 6d. per ton, minimum 4-ton lots, carriage paid on contract. Spot material, 10s. per ton extra.

SODIUM ACETATE.—In good demand and spot material scarce. Quoted £20 5s. per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3d. per lb., delivered buyers' works, minimum 4-ton lots. Under 4 and over 2-ton lots, 3 1/16d. per lb. Under 2-ton lots, 3⅛d. per lb.

SODIUM CARBONATE (SODA CRYSTALS).—£3 to £5 5s. per ton, ex quay or station. Powdered or pea quality, 27s. 6d. per ton extra.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots.

SODIUM NITRATE.—Quoted £11 per ton, ex store.

SODIUM NITRITE, 100%.—Quoted £19 10s. per ton, ex store.

SODIUM PRUSSIATE (YELLOW).—In moderate demand and price unchanged at about 4½d. per lb, ex store. Offered for prompt shipment from the Continent at 4¼d. per lb., ex wharf.

SODIUM SULPHATE (SALT CAKE).—Prices 50s. per ton, ex works, for unground quality, 52s. 6d. per ton, delivered. Ground quality, 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices now as follows: solid, 60/62%, £9 per ton; broken, 60/62%, £10 per ton; crystals, 30/32%, £9 2s. 6d. per ton, delivered buyers' works on contract, minimum 4-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 15s. per ton; rock, £10 12s. 6d. per ton; floristella, £9 10s. per ton; ground American, £9 5s. per ton; ex store. Prices nominal.

ZINC CHLORIDE.—British material, 98/100%, quoted £24 15s. per ton, f.o.b. U.K. ports; 98/100%, solid, on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports. Powdered 20s. per ton extra.

ZINC SULPHATE.—Continental material quoted £11 15s. per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Magnesite Industry in Madras

DETAILS of the magnesite industry in the Madras Presidency are given in the report of the Department of Industries, for the year ended March 1, 1927, which has recently been issued.

The deposits of magnesite mined in the Salem district are reputed to be of exceptional quality and the calcined material is considered to be about the best in the world for magnesite composite floorings and other similar uses in the building industry. The mining operations are conducted by only one firm, though in connection with the exploitation of the Kanjamalai iron ores, 729 tons of magnesite are reported to have been discovered. The output during the year decreased by nearly 1,000 tons due to the considerable slackening in the general demand for calcined magnesite, as a result of increasing competition from the deposits in Europe and America, especially the latter. Though almost unlimited quantities of crude magnesite of a very fine grade can be supplied, it has not been possible so far to increase the demand for the material. The industry moreover is handicapped by heavy rail and sea freight, affecting both export to foreign markets and possible business in India.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, March 29, 1928.

The demand for heavy chemical products on the Manchester market this week has been about up to its recent level. On the whole, there is a moderate business being put through in the leading lines and a fair volume of fresh inquiry is in circulation in the spot market. Prices generally are maintaining their steadiness and, although there is exceptionally keen competition for the business that is offering, there is comparatively little weak selling in evidence.

Heavy Chemicals

Chlorate of soda is in quiet request at the moment, but prices are fairly steady at from 2⅞d. to 3⅛d. per lb., according to quantity. There is a moderate inquiry about in the case of hyposulphite of soda, offers being maintained at about £16 10s. per ton for the photographic quality and £9 15s. for the commercial. Nitrite of soda is a firm section at £19 5s. per ton and a quietly steady trade is being put through. Caustic soda is moving off in good quantities against contracts, with makers' offers unchanged at from £13 7s. 6d. to £15 7s. 6d. per ton, according to quality. Bleaching powder is attracting a fair amount of interest at the moment and quotations are still on the contract basis of £7 per ton. Bicarbonate of soda is well held at round £10 10s. per ton and a moderate amount of business has been reported this week. With regard to sulphide of sodium, the tendency seems to be easy and inquiry is rather slow; the 60–65 per cent. concentrated solid quality is quoted at from £9 10s. to £10 per ton and the commercial at £7 15s. Current offers of phosphate of soda range from £12 5s. to £12 10s. per ton, the demand being on quiet lines. Bichromate of soda keeps steady and meets with a fair volume of inquiry at 3¼d. per lb. There is comparatively little stirring in the case of saltcake, but contract quotations are still at £2 12s. 6d. per ton. Prussiate of soda is quiet but values keep fairly steady at about 4⅜d. per lb. A steady inquiry for alkali is reported at £6 2s. 6d. per ton to home users.

Among the potash compounds permanganate is in limited request and prices are easy, from 5d. to 5¼d. per lb. being quoted this week for B.P. material and about 4¾d. per lb. for the commercial. Bichromate of potash meets with a fair enquiry at up to 4¼d. per lb. Carbonate of potash keeps steady at from £25 5s. to £25 10s. per ton, a moderate business in this material being put through. Caustic potash is in quietly steady demand and values keep firm on the basis of £33 5s. per ton for prompt delivery of one to five-ton lots. Buying interest in chlorate of potash is rather slow at the moment and the tendency is easy at round 3d. per lb. Yellow prussiate of potash is steady at 6½d. per lb., although there is not much business passing in this.

The movement of sulphate of copper for export is still on a moderate scale and offers are firm at up to £27 per ton, f.o.b. There is not much stirring in arsenic but there has been little change in the price situation, round £17 5s. per ton at the mine still being generally quoted for white powdered, Cornish makes. Nitrate of lead is fairly steady at about £37 per ton, a quiet demand being reported. Acetate of lead is about maintained, white material offering at £40 10s. per ton and brown at £38 10s. Acetate of lime appears to be in better supply and there has been some easing of quotations; the value of grey to-day is about £16 per ton and of brown £10 to £10 5s.

Acids and Tar Products

Oxalic acid is well held at from 3¼d. to 3⅜d. per lb., according to quality and a fair trade is being done. Tartaric acid is on the quiet side but quotations are firm on comparative scarcity at round 1s. 4½d. per lb. Citric acid is in a somewhat similar position and current offers are at about 1s. 11½d. per lb. Acetic acid keeps very steady and a moderate demand is reported at £66 per ton for glacial and about £37 10s. for 80 per cent. commercial.

There is only a limited business passing in pitch just now and prices are largely nominal at round £3 per ton, f.o.b. Solvent naphtha is in moderate request and values are held at about 11d. per gallon. Creosote oils is in fair demand both on home and export account, with offers at 7¼d. per gallon at works. Carbolic acid crystals meet with some inquiry and prices are maintained at 6½d. per lb.; crude material remains steady at 2s. 3½d. per gallon.

B.D.H. Annual Meeting

Chairman on Improved Trade

The annual general meeting of British Drug Houses, Ltd., was held in London on Tuesday, Mr. C. A. Hill, chairman and managing director, presiding. For the first three months of last year, he said, business was highly encouraging, due largely to accumulated orders which had lain dormant in the coal stoppage. For the succeeding six months business was distinctly depressed, but revived in the last quarter of the year, in which the company's business showed a satisfactory increase over 1926. The increase was equally divided between home and export trade. A year ago, the directors had promised rigid economy consistent with maintaining the standard of their products. This promise had been well kept, though 1927 did not and could not derive a full year's benefit from the measures adopted. While he felt the chairman's speech was not the right occasion for advertising a company's products, he felt that some reference to vitamin products was expected, in particular to vitamin D products, which were being manufactured on a large scale. Not only vitamin products but many others of a scientific character were now receiving a gratifying amount of recognition from members of the medical profession.

The report, said Mr. Hill, stated that "the directors consider that the results of the year's trading, having regard to all circumstances, are satisfactory"—a statement which they intended to be taken very literally. Recovery from the serious difficulties of 1926 was not made in a year and trading conditions in 1927 were none too bright. In those circumstances they regarded the results as satisfactory; but that was not to say that they should regard them as a satisfactory standard for the future.

The trading profit for the year was £57,979 12s. 6d. After deducting prior charges and paying the Preference dividend, £36,951 was carried to the balance sheet. The directors recommended a dividend of 6 per cent., less tax, on the ordinary shares for the past year. The report and accounts were adopted.

Annual Meeting of Hadfields, Ltd.

The ordinary general meeting of Hadfields, Ltd., was held at Sheffield, on Monday, when Sir Robert Hadfield occupied the chair. Referring to the present condition of the steel industry he asked why the Government of the day had not done something to assist the iron and steel industry. Surely something could be done in the matter of rates and taxes? They were still feeling the effects of the coal stoppage in lost markets, not only at home but abroad. In quite a number of instances foreign competitors stepped in, and it would take them sometime to recover their former position. With regard to the trend of the steel industry, he said that without doubt the average quality of British-made steel was superior to that of steel produced abroad. In this country we were concerned primarily in maintaining our output of best quality steels for a great variety of purposes. To-day the progress of the world in the highest and most important branches of industry depended on the production of alloy steel of the highest quality. In that direction this country had led the way. He closed with a reference to the successful working of Bean Cars, Ltd., of Tipton.

English Crown Spelter: General Meeting

The forty-eighth general meeting of the English Crown Spelter Co. was held at Swansea on Tuesday. Mr. Reginald Francis, chairman of the company, pointed out that the new acid plant of the company had worked since the second half of November. By means of the plant the company could now manufacture acid from sulphurous gases which had for many years been emitted into the atmosphere. The recovery of the sulphur contents of ores and the manufacture of sulphuric acid was a definitely profitable utilisation of their second and most important by-product, and further, it provided the company with another by-product of appreciable value in sulphate of lead. The company had entered into an agreement for the disposal of the whole production of both sulphuric acid and lead sulphate up to June 1930.

Company News

FLEMING AND FERGUSON.—A dividend of 2 per cent., less tax, for the year is announced on the ordinary shares.

ANGLO-PERSIAN OIL CO.—At a meeting of the directors on Tuesday, it was decided not to pay an interim dividend on the ordinary shares in respect of the year ending March 31, 1928.

CHESHIRE UNITED SALT CO.—In a circular to shareholders, the directors state that the profit for the three months to the end of February last amounted to £2,113, against £1,595 for the previous quarter.

VEREINIGTE GLANZSTOFF.—At a meeting of the board on Monday it was decided to propose at the general meeting on April 20 that a dividend of 18 per cent., compared with 15 per cent. last year, be distributed.

ALIANZA CO.—A cabled message from the local board in Valparaiso states that the gross profit for the year 1927 was £133,354, and the net profit £43,033. It has been decided not to recommend the payment of a dividend, but to carry forward £214,734.

BEDE METAL AND CHEMICAL CO.—The report for the year ended December 31, 1927, states that operations have resulted in a profit (after payment of £2,414 for interest on bank overdraft) of £14,611. The directors recommend a dividend of 5d. per share for the year, less income-tax, and allocating for necessary replacements, etc., in works £6,000, leaving to be carried forward £4,976. For the previous year there was a loss, after payment of £2,466 for interest on bank overdraft, of £4,968, to which was added debit balance in of £51,536, making a total debit of £56,504.

WRIGHT, LAYMAN AND UMNEY.—The accounts for the year ended December 31 last show that after providing for directors' salaries as departmental managers, staff bonus, bad debts, depreciations, pensions and income-tax, there is a trading profit, including income from investments, of £38,196. After adding the amount brought forward of £5,894, there remains to the credit of profit and loss £44,090. The directors' fees absorb £4,400, and the board recommend a final dividend of 15 per cent. on the ordinary shares, making 25 per cent. for year, less income-tax at 4s.; together with a bonus of 2s. per share, less tax, carrying forward £10,170.

COURTAULDS, LTD.—At extraordinary general meetings of the company, held on March 23, resolutions were unanimously confirmed making alterations in the articles of association, and increasing the capital to £32,000,000 by the creation of 12,000,000 new ordinary shares, and further capitalising £9,000,000 standing to the credit of capital reserve account and £3,000,000 standing to the credit of general reserve account to be applied in paying up at par 12,000,000 ordinary shares of £1 each, such fully-paid shares to be allotted to the ordinary shareholders whose names were registered on the books of the company at the close of February 21 last at the rate of one new share for every share held.

BRITISH OIL AND CAKE MILLS.—For 1927 the trading profits increased from £251,518 to £410,864, the total, including interest dividends etc., being £793,170, compared with £664,496 in 1926. The net profits, after deduction of salaries, debenture interest, depreciation, etc., are £702,857. This shows an increase of £484,821 on 1926, but the gross profits of that year had to bear a charge of £536,666, representing the balance of the cost of establishing and developing "New-Pin" soap. A dividend of 12½ per cent., less tax, is recommended on the preferred ordinary shares, against 10 per cent. for 1926, which was paid with the assistance of £113,750 transferred from the preferential dividend reserve fund. The ordinary shares, all of which are held by Lever Bros., now receive 8¼ per cent., less tax, the first payment on that class of capital since 2½ per cent. was distributed for 1925. The carry-forward is increased from £33,633 to £34,492.

Tariff Changes

UNION OF SOUTH AFRICA.—The Board of Trade has received a copy of the text of a Bill which has been introduced by the Union Minister of Health and has been submitted for a second reading, which is to consolidate and amend the laws for preventing the import or sale of drugs which are unwholesome or adulterated or incorrectly or falsely described.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks, and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to April 14, 1928.

SOLVAY

"SOLVAY."

Registration of this trade mark shall give no right to the exclusive use of the word "Solvay."

485,311. Class 2. Alkalies for agricultural, horticultural and veterinary purposes, and not for export to and sale in China, Hong Kong, Mongolia, Thibet, Siberia, all Chinese territory leased to foreign powers, French Indo-China and Hainan.

485,312. Class 42. Bicarbonate of soda, for use as food, salt, and not for export to and sale in China, Hong Kong, Mongolia, Thibet, Siberia, all Chinese territory leased to foreign Powers, French Indo-China and Hainan. Brunner, Mond and Co., Ltd., Winnington, Northwich, Cheshire; alkali manufacturers. — October 28, 1927. (To be Associated. Sect. 24.)

Opposition to the Registration of the following Trade Marks can be lodged up to April 21, 1928.

"ASTO."

486,672. Class 1. Preparations for the prevention and removal of boiler scale. Arthur William Croft Tyrer, trading as Tyrer and Co., Distillery Buildings, Church Street, St. Helens; manufacturer.—December 10, 1927.

"BAYKOCHROMLICKER."

488,353. Class 1. Chemical substances used in manufactures, photography or philosophical research, and anti-corrosives. I. G. Farbenindustrie Aktiengesellschaft (a joint stock company organised under the laws of Germany), Mainzerlandstrasse 28, Frankfort-on-Main, Germany; manufacturers.—February 9, 1928. (To be Associated. Sect. 24.)

"POLYTEX."

487,473. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives.

487,474. Class 4. Raw, or partly prepared, vegetable, animal, and mineral substances used in manufactures, not included in other classes. Society of Chemical Industry in Basle (a joint stock company organised under the laws of the Swiss Republic), 141 to 227, Klybeckstrasse, Basle, Switzerland; manufacturers and merchants.—January 11, 1928. (To be Associated. Sect. 24.)

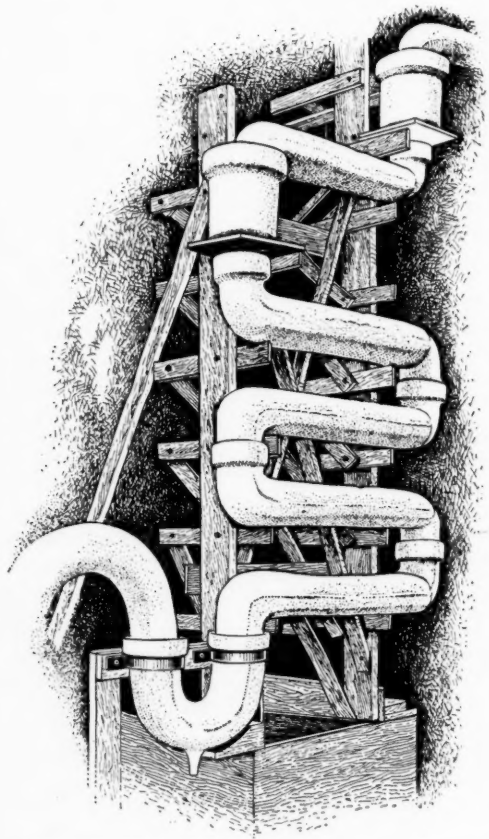
Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

RAW MATERIALS FOR INDUSTRIAL CHEMICALS.—A manufacturers' agent in Melbourne desires to obtain the representation of British manufacturers of raw materials used in tanning and industrial chemicals. This agent is also interested in nitrocellulose and the various solvents with which it is used. (Reference No. 272.)

INDUSTRIAL CHEMICALS.—A firm of chemical merchants in Montreal who are interested in the sale of industrial chemicals throughout Eastern Canada desire to represent British makers. (Reference No. 282.)

The "VITREOSIL"



COLUMN OF "VITREOSIL" ABSORPTION VESSELS.

System of
HYDROCHLORIC ACID ABSORPTION

THESE VESSELS set up Vertically one above the other can be thoroughly Water Cooled.

Economies of Floor Space and Efficiency of Operation are secured. There are no submerged joints.

In this System an intimate contact of the gas with the liquid is secured by means of the liquid curtain formed by the drops falling from the central depression and through which all the gas must pass.

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ABC Code, 5th & 6th Editions, & Bentley's used

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

SUNLAC, LTD., 53, Berners Street, W., paint manufacturers. (C.C., 31/3/28. £22 14s. 9d. February 9.

London Gazette, &c.

Company Winding Up

VAUXHALL CHEMICAL CO., LTD. First and final dividend, 1s. 8¼d. per £, payable March 23, at the office of the Official Receiver and Liquidator, 33, Carey Street, Lincoln's Inn, London, W.C.2.

Companies Winding Up Voluntarily

BENTLEY (ISAAC) AND CO., LTD. (C.W.U.V., 31/3/28.) By special resolution, March 17, confirmed March 22. A. Burgess, 4, Chapel Walks, Manchester, appointed as liquidator for the purpose of reconstruction. Meeting of creditors at the offices of Addleshaw, Sons and Latham, 15, Norfolk Street, Manchester, on Tuesday, April 10, at 3.30 p.m.

OAKS CHEMICAL CO., LTD. (C.W.U.V., 31/3/28.) By special resolution, February 28, confirmed March 17. W. Wood, Eskdale, Oakenshaw, near Bradford, appointed as liquidator.

SPARKEL TOOTH CREAM CO., LTD. (C.W.U.V., 31/3/28.) W. J. Hodge, 26-27, Union Bank Buildings, Holborn Circus, E.C.1, Accountant, appointed as liquidator, March 23. Meeting of creditors at the office of Wilson Wright and Co., Chartered Accountants, 26-27, Union Bank Buildings, Holborn Circus, E.C.1, Thursday, April 12, at 12 noon.

New Companies Registered

HENRY ELLISON (GLASGOW), LTD., 190, Dawsholm Road, Maryhill, Glasgow. Registered as a "private" company in Edinburgh on March 22. Nominal capital, £50,000 in £1 shares. Tar and ammonia distillers, alkali makers, manufacturers of chemical products of all kinds, soap boilers and candle makers, india-rubber manufacturers, etc. Directors: H. Ellison, and F. Ellison.

LOCKE, SPIER AND CO. (1928), LTD. Registered March 22. Nominal capital, £2,000 in £1 shares. Importers, exporters, merchants and distributors of shellacs and other kindred gums, manufacturers of and dealers in aniline, colours, paints, pigments, varnishes, oils, dextrines, minerals, etc. Directors: E. Spier, 9, Fort Road, Sedgley Park, Manchester, and A. R. Vaughan.

M. AND B., LTD. Registered March 26. Nom. capital, £1,000 in £1 shares. Tallow melters, and manufacturers, tallow chandlers, fat melters, oil and grease manufacturers, bone crushers, makers of bone meal and other artificial manures, soap boilers and makers, etc. Directors: L. Morel, 325, Brixton Road, London, S.W.9., A. A. Brown.

T. MACMASTER, LTD., 322, Dumbarton Road, Partick, Glasgow. Registered in Edinburgh March 23. Nom. capital, £12,000 in £1 shares. Wholesale, retail and manufacturing chemists and druggists, etc. Directors: T. Macmaster and A. Sharp.

NEW PROCESS SOAP, LTD. Registered as a "private" company on March 27. Nom. capital, £25,000 in 20,000 8 per cent. cumulative preference shares of £1 each and 10,000 deferred ordinary shares of 1s. each. Manufacturers of soap, manufacturers and refiners of and dealers in oils, oleaginous and saponaceous substances, and all kinds of unguents and ingredients, manufacturing and general chemists and druggists, etc. A subscriber: H. C. Mitchell, 27, Kempshead Road, Camberwell, London.

SOUTHERN TAR DISTILLERS, LTD., Aldwych House, Aldwych, London, W.C.2. Registered March 24. Nom. capital, £100 in £1 shares. Distillers of tar, shale, resin, pitch, oil and coal, etc. A subscriber: G. W. Palmer.

W. URQUHART, LTD., 133 and 133a, Church Street, Paddington. Nom. capital, £3,000 in 100 7½ per cent. cumulative preference shares of £10 each and 2,000 ordinary shares of £1 each. Paint, varnish and enamel manufacturers, dealers in lacquers, oil and other colours, etc., and to acquire the business carried on at 133 and 133a, Church Street, Paddington, and 157, High Street, Notting Hill, as W. Urquhart. Directors: W. J. Ogden, A. Urquhart, A. Millis, W. W. Kimber.

Manufacture of Ethylene Glycol

PATENT Specification 286,850, by the British Dyestuffs Corporation, K. H. Saunders, and H. Wignall, which has just been accepted, deals with "Improvements in the Manufacture of Ethylene Glycol." It is pointed out in the specification that the usual methods of preparation of ethylene glycol consist of the discontinuous distillation of crude ethylene chlorohydrin, followed by the hydrolysis of the latter with alkali. The present invention makes the concentration and hydrolysis continuous. Steam ascends in a tower containing a suitable packing material, meeting a downflowing stream of crude ethylene chlorohydrin solution. The chlorohydrin vapour is carried up with the steam, and enters a tower where it meets a downflowing stream of sodium carbonate solution, which hydrolyses it to ethylene glycol. If caustic soda be used instead of carbonate, ethylene oxide is obtained.

American Molybdenum Production Increased

A total of 216,595 short tons of ore was milled in the United States last year, from which concentrates carrying from 75.14 to 95.4 per cent. of molybdenum sulphide M_0S_2, equivalent to 2,299,217 lb. of elemental molybdenum, were obtained—an increase of about two-thirds over 1926. Of the concentrates produced 2,286,075 lb., valued at the mines at $1,858,786, was shipped. Nearly all of the output was made into calcium molybdate, in which form it is added to steel. Perhaps the most important event of the year in the molybdenum industry was the announcement that the price of the metal contained in calcium molybdate would be reduced at the beginning of 1928 from $1.20 per lb. to 95 cents per lb. The reasons for the reduction were that the larger sales had allowed mills to be run more nearly at full capacity with consequent lower costs and that the lower prices would probably encourage a still larger use.

Benn Brothers' Other Journals

THE CABINET MAKER.—Special Spring Number: Furnishing Advertising under the Searchlight; Encyclopædia of Textiles; Developments in Twentieth Century Furniture; Furnishers and Refrigerators.

THE ELECTRICIAN.—Special Spring Trade Number: "A New Art in Electric Lighting," by W. E. Bush; "Stock Control for the Retailer," by A. E. Hammond; "Selling 'The Effect,'" by C. Sylvester.

THE FRUIT GROWER.—"Marks for Imported Apples"; Ghent International Show; "Apple Scab Control," by E. M. Bear.

GARDENING ILLUSTRATED.—Wisley Gardens in Spring; The Importance of Setting Grapes; Easter Work in the Garden.

THE GAS WORLD.—Mr. C. Valon Bennett's Presidential Address before the Southern Association of Gas Engineers; Midland Association of Gas Managers: Address by Mr. W. G. S. Cranmer; Institute of Fuel: Discussion on Industrial Costs.

THE HARDWARE TRADE JOURNAL.—Spring Annual; Buying for the Spring Trade; New Hardware for the Coming Season; Ironmongers' Assistants' Examinations; The Question Paper; Old Pewter; West Yorkshire Ironmongers and Hire Purchase.

TIMBER TRADES JOURNAL.—The Finnish Timber Market; Appointment of an Umpire; Income Tax and Fire Insurance: A Legal Aspect; The Sawing of Teak: First of a Special Series.